PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.

Vol. 112, No. 17 Thursday, April 24, 1941 Price Ten Cents

Government To Open Paper Bids On May 19

Asks Proposals For Supplying the Government Printing Office With Wide Variety of Paper For the Six Months' Period Beginning July 1—Semi-Annual Bids Will Cover About 57,107,000 Pounds.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., April 23, 1941—Joint Congressional Committee on Printing has announced that it will receive bids on May 19 for a six months supply of paper for the use of the Government Printing Office beginning July 1 next. It will also receive bids on the same date for the annual supply of envelopes. It is estimated that the paper to be needed for the six months period will be approximately 57,107,000 pounds.

Specifications Committee Report

Following is the report to the Congressional Committee by its paper specifications committee headed by Ansel Wold as chairman:

The Committee on Paper Specifications respectfully submits its Forty-first Report and the accompanying recommended schedule for paper for the public printing and binding and blank paper for the use of the Government departments and establishments in the District of Columbia for the term of 6 months, beginning July 1, 1941.

Paragraphs 44, 45, 46, and 48 of the Instructions were renumbered 43, 44, 45, and 46, respectively. Two new paragraphs, numbers 47 and 48, describing the methods of testing for alpha cellulose and copper number were added to the Instructions.

Paragraph 43, "Sampling," and paragraph 50, "Acidity," of the Instructions were revised to conform with revised methods of the paper industry.

Paragraph 83, "Bond," was revised to permit the contractor to give bond amounting to 20 percent instead of 25 percent of the estimated amount of the contract.

Lots 3–14—Machine finish book.—The smoothness requirement was increased in order to improve the printing quality of the paper.

Lot 16—Offset book.—The specification for this grade of paper has been revised to improve the quality of paper for offset printing. Ash, opacity, and surface strength requirements were added to this specification. The folding endurance requirement was increased from 10 to 30 double folds, and the bursting strength was increased from 20 to 30 points.

Lots 47, 58, 59, 112, and 210—Modifications made in sizes.

Lots 64, 65, 66 and 67, and 69—Lithograph finish map and chart papers.—The moisture content requirement was revised to permit a somewhat greater tolerance.

Lots 65, 66 and 67, 73 to 76, 83, 109 to 117, 120 to 123, 125 and 126, 154 to 157, 160 to 165, 168 to 173, 190 to 193—Rag content lithograph finish map, manifold, bond, ledger, and index papers.—The ash content of these papers has been reduced from 5 to 2 percent.

Lot 69—100 percent rag white chart.—New white, cream, or unbleached rags are required.

Lots 69, 128 to 129, 140, 141, 176 to 181, and 196—100 percent rag chart, bond, parchment deed, ledger, and index papers.—Alpha cellulose and copper number tests, which are indicative of the purity of cellulose fiber, have been included in the specifications for these grades of papers intended for permanent-record use in order to improve their permanence.

Lots 125 and 126—75 percent rag white bond.—The minimum order requirement was reduced from 2,500 pounds to 2,000 pounds.

Lot 196—100 percent rag white index.—This paper is required to be delivered on skids instead of in cases. Also a requirement has been added that the paper must be uniform in thickness and as near .0100 inch as possible.

Lots 198, 260, 261—Facing stereo tissue, white and red stereotype molding.—These papers have been eliminated from the schedule, as they are no longer needed.

This schedule embraces 168 lots, which is three less than the preceding schedule. The quantity estimated for the term of 6 months beginning July 1, 1941, is approximately 57,107,000 pounds, as compared with 60,069,000 pounds for the previous contract period of 6 months.

Papers on Which Bids are Requested

Quantities of paper on which bids will be received include the following:

2,000,000 pounds newsprint paper.

(Continued on page 24)

Bill to Create "Forest Works Authority"

Wisconsin Legislature To Consider Measure To Establish Central Office To Consolidate Forest Activities — Less Fire Damage Expected This Year—Lake Pulpwood Shipments Start—Late News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., April 21, 1941—In order to consolidate forestry activities in Wisconsin, the Legislature has before it for consideration a bill creating a "Forest Works Authority." Its proposals are sponsored by Assemblyman Berquist of Rhinelander, Wis., who is located right in the northern forest region.

The authority would be administered by a director appointed by the governor and would be implemented with a biennial appropriation of approximately $1,000,000. Half of this sum would come from highway revenues and the remainder from increased sportsmen's fees.

The authority would be empowered to lease tax-delinquent lands for reforestation and would be in charge of administration of the forest crop law. Great strides already have been made in reforestation, but it is believed a more centralized administration would accomplish much more to hasten the replenishing of the timber and pulp wood supplies.

Fewer losses from forest fires are expected this season, due to the use of 20 ultra-high frequency two-way radio sets in the federal forests of northern Wisconsin. Fire tower observers will be able to communicate quickly to all fire fighting units and CCC camps the locations of small fires. Faster mobility of tank trucks will result, and few fires will have a chance to gain any headway.

Lake Shipments of Pulpwood Start

Pulpwood shipping on the Great Lakes is being resumed for the season with the opening of navigation a week earlier than usual. The first steamer to move is the Mindemoya, which has been docked at Marinette, Wis. for the winter. It will start hauling wood from Canadian ports to harbors on the Great Lakes.

Coal shipments also are being started by the Fox River Navigation Company, Kaukauna, Wis., from the docks at Green Bay, Wis. to mills of the Fox River Valley. Navigation is impeded on the Fox River somewhat by higher water, since it has been necessary to open numerous sluice gates to drain off spring flood waters. The level of Lake Winnebago, storage for the river, is reported to be more than 17 inches above the crest of the control dam at Menasha, Wis.

High water troubles also are being experienced on the Prairie and Wisconsin Rivers, largely due to heavy rainstorms. A temporary flood was reported at Merrill, Wis., resulting in flooding of the Ward Paper mill. Production was only temporarily halted, however. The generator room was put out of commission until the waters receded.

Safety Meeting Held at Kimberly

More than 500 persons attended the last of a series of safety meetings of the Kimberly-Clark Corporation mill at Kimberly, Wis., Tuesday evening, April 15. The session was held in the high school gymnasium, with Edward A. Page, of the industrial relations department, as the speaker. He emphasized seven points of safety and used slides to illustrate his talk. The high school glee club, local entertainers and talent from WLS radio station furnished the remainder of the program. Dudley Courchane, safety director at the mill, was master of ceremonies.

Sawyer To Erect Warehouse

The Sawyer Paper Company, Neenah, Wis., has placed a contract with the W. J. Durham Lumber Company for erection of a warehouse, estimated to cost $3,800. It will be constructed of cement blocks and will be 34 by 46 feet in size.

K.-C. Bowlers Hold Meeting

The Kimberly-Clark Corporation Bowling League held its annual post-season banquet at the Valley Inn, Neenah, Wis., Thursday evening, April 17. Prizes were distributed. First place was won by the Hyfects, and the Sulphites and B.T.U.'s were tied for second and third places. Fourth place was won by the Saneks, and the Researches and Sulphites tied for fifth and sixth places.

Officers were elected as follows: President, Hamilton Craig; vice-president, Warren Whittlinger; secretary-treasurer, Elmer Gollnow; members of the arbitration board, Francis Bremmer and Dan Behnke.

A. A. Hennig of Neenah, former president of the Wisconsin State Bowling Association, was the speaker.

Frank Whiting Lands Swordfish

Frank B. Whiting of Nenasha, Wis., president of the George A. Whiting Paper Company and the Whiting-Plover Paper Company, is demonstrating his prowess as a fisherman during a vacation he and Mrs. Whiting are enjoying at Honolulu, Hawaii. On one of his expeditions, he landed a 100-pound swordfish, after a twenty-minute battle. Mr. and Mrs. Whiting expect to return home in a few weeks.

Metz-Nelson Nuptials

Peter Metz, Jr. of Kaukauna, Wis., and Miss Margaret Nelson, also of Kaukauna, were married April 14 at St. Mary Catholic Church at Kaukauna, by the Rev. Alphonse Roder. Mr. Metz is a chemist at the Marathon Paper Mills Company's Menasha Products division at Menasha, Wis.

Maclaren Subsidiary Lets Contract

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., April 21, 1941—The Maclaren-Quebec Power Company, wholly owned subsidiary of the Maclaren Power and Paper Company, has awarded to the Foundation Company of Canada a contract for the construction of additional storage works for power production, at an estimated cost of approximately $1,500,000. Preliminary work is now commencing by the contractors, and the contract is scheduled for completion by March, 1942.

Canadian Industry Mobilized for Defense

Machine Shops At Most Paper and Pulp Mills Will Be Utilized To Make Smaller Parts of Large Machinery Units — Pulp and Paper Now Under Industrial Disputes Act — Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., April 21, 1941—The pulp and paper industry in Canada has mobilized its forces of skilled workers and technically trained staff to render essential assistance to war industries, particularly those making the heavier types of machinery for the armed forces. The mobilization, now on a broad and practical basis, is three fold in character. It involves:

First: using machine shops existing at almost all pulp and paper mills for maintenance of their own equipment and machines to make the smaller parts and assemblies needed to complete large machinery units; second: release or loan of technically trained staff and skilled workers to form the backbone of organization needed to operate war industries now expanding or about to come into operation; third: Training Schools to educate, by means of short and simple courses of training, skilled workers from the general mill staff of pulp and paper mills, so that there will be a steady flow of capable workers to replace those released or loaned to war industries.

None of these activities represents money profits to the companies concerned, but they are so planned that there will be no impairment of the major support to the wartime economy of Canada brought about by the exports of pulp and paper.

Effectiveness of the Plan

Citing an example of the effectiveness of the plan, the Financial Times of Montreal says that when an emergency of the first order recently arose, within twenty-four hours plans for its solution were completed, and within a week it was dealt with effectively. This involved the transfer of a large number of skilled workers to a war industry; it was accomplished without dislocation of the pulp and paper mill operations because of the broad program the pulp and paper industry had initiated, and the ready spirit of all the workers to pull their full weight in Canada's war effort.

Paper Under Industrial Disputes Act

The Dominion Government has brought the pulp and paper industry within the scope of the Industrial Disputes Act. In announcing this Labor Minister McLarty states that in future any differences between employees and employers which cannot be settled by negotiation or conciliation may be referred to a board of conciliation and investigation established by the minister.

The minister said the importance of the pulp and paper industry to the war effort could be seen in the fact it produced annually about $240,000,000 in United States funds through export sales.

Authority for the minister's action was given by an order-in-council passed under the War Measures Act shortly after the outbreak of war. This order-in-council extended operation of the Industrial Disputes Investigation Act to industries engaged in production of supplies and munitions of war essential to Canada.

Boards of conciliation and investigation are made up of three members, one nominated by the employees, one by the employer and the third, who acts as chairman, on recommendation of the other two. Failing agreement, the chairman is appointed by the minister.

A section of the act makes it unlawful for any employer to declare or cause a lockout or for any employee to go on strike prior to or during the reference of a dispute to a board of conciliation.

Bill Provides for Reforestation

A bill has been introduced in the Quebec Legislature providing for: Encouragement of forestry engineers for sylvicultural work in leased forests by a reduction in stumpage dues; provision for the purchase of lands necessary for forestry instruction; permission to increase the volume of timber-cutting authorized by special permit to a maximum of 300,000 cubic feet; and the bill grants the requisite powers to establish township reserves and forest settlements, even in localities where land is no longer available for such purposes.

Supporters of the bill states that it fills a long standing demand, as the rate of forest depletion is alarming. At the present time, because of the stoppage of wood exports from Scandinavian countries, the province is undergoing a veritable wood cut boom, which certainly has the effect of putting money into circulation, but results in many cases in indiscriminate cutting. This latter, it is sought to remedy, at the same time making plans for the cultivation of new growth.

White Pine Succession

The National Research Council has just issued an interim report on the results of a survey on the Ottawa Valley of cut-over and burned-over stands of white pine. Seven widely distributed areas on both sides of the Ottawa River were examined. Data on fire history, soil conditions, herbaceous, shrub and tree vegetation and tree growth were recorded. It was found that (i) white pine regeneration on cut-over and burned-over lands is generally insufficient for future requirements; (ii) white pine in tolerant hardwood cover-type is no longer significant; (iii) an insufficient number of seed trees remains after cutting, and the maximum number of seedlings is not greater than double the number of the stand present prior to cutting, which is considered inadequate; (iv) burning in stands of mature timber stimulates regeneration, but results of fire in young stands are still doubtful and additional data are required in this connection.

Hopes to Renew Study

While further work in this field has had to be discontinued because of the war, the committee hopes to renew the study as soon as possible and to make a further examination of the relations between seed supply, seed year and the resulting regeneration on burned and unburned soils.

Reports Presented on Ontario Timber Probe

Majority Report Commends Proration As Stabilizing Factor In Newsprint Industry — Minority Report Accepts Proration But Claims Regulation Is Not Properly Enforced — Concerns Cited.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., April 21, 1941—Reference was made on this page last week to some of the salient features of the report of the Select Committee of the Ontario Legislature inquiring into the administration of the Department of Lands and Forests. The report has just been tabled in the legislature and some discussion had taken place, which developed into what seemed to be more of a political jousting bout than a genuine desire to evolve helpful suggestions for legislative measures that would improve conditions in the timber industry. Even with a closer study of the report itself, it is difficult to distinguish between purely political manoeuvering and forthright opinion.

As previously stated, there was both a majority report and a minority report presented, the latter being signed by Col. Geo. A. Drew, the conservative opposition leader, and while the two reports agree in principle, on several points, such as proration, they differ as to details.

Majority Report Commends Proration

The majority report grants that proration has aided in giving the industry some measure of stability and obviates the necessity for "government intervention." If the time should come, however, when the newsprint industry's own committee on proration needed active assistance from Ontario and Quebec governments, then the majority report recommends a joint board should be established. On the board there should be representatives of the two governments. It should act with definite legislative sanction of the two governments, something which is lacking at present, and be given power to conduct discussions with the industry's committee. As a liaison between the industry and government, such a board could offer recommendations to the two governments. Legislation could thus be brought down which would stamp out at the inception any conditions which might re-establish the unbalanced competition of former years.

The majority report urges that Ontario, Quebec and the newsprint industry should give unbiased study to exemptions from proration granted to several newsprint mills which are wholly, or partly, owned by United States or British publishers. The report goes on to say that, generally speaking, these exemptions were granted to companies which were not competing commercially and therefore not affected by fluctuations in prices and that such companies were induced to invest capital here for the express purpose of securing their own newsprint requirements. If these companies are placed under obligation to prorate, the majority report claims, they will be compelled to limit production in their own mills and go into the open market for the balance of their requirements and pay a higher price. Such a condition, the report adds, would not, in the opinion of the committee, be conducive to healthy business practice.

Minority Report Cites Poor Regulation

The minority report accepted proration as necessary, but claimed that it is not now being properly enforced, and criticized the use of the Forest Resources Regulation Act to enforce it. The minority report contended that if the government intends to enforce proration by law, the enabling legislation should specifically refer to proration, but claimed that there was a much more effective way of enforcing it than by any indirect method devised by the governments of Ontario and Quebec. There is no question, the minority report stated, of the right of the Dominion government, under the War Measures Act, to control the output of the newsprint or any other industry.

The minority report states that proration is only necessary while an industry is not producing at full capacity, which means producing less economically. Post war conditions will compel Canadian newsprint mill to compete on a price basis with other countries and they will not be able to do this unless the price is based on maximum efficiency of production. For that reason, it was argued in the report, the control which can be exercised by the Dominion government for the duration of the war is adequate, and that the industry should make direct representations to the Federal authorities for this purpose.

The minority report reviews eight contracts signed by the Minister of Lands and Forests, Hon. Peter Heenan, in 1937. All required the companies to build pulp and paper mills within a fixed period of time, but only one had done so and that failed.

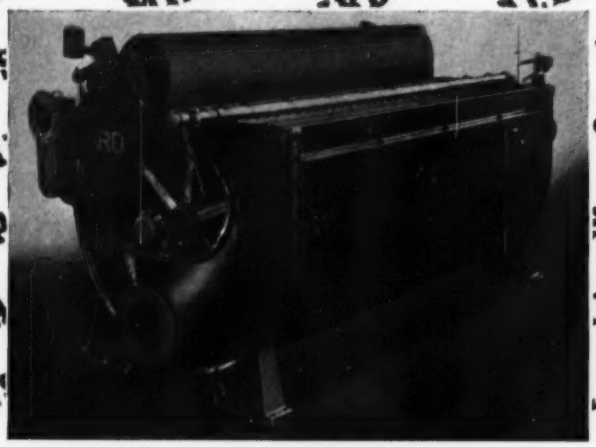
Lake Sulphite and Other Companies Cited

The companies cited were: Lake Sulphite Pulp Company; General Timber Company; Pulpwood Supply Company; Huron Forest Products; Sault Pulp Products; English River Pulp and Paper Company; Vermilion River Pulp Company and Western Pulp and Paper Company.

Though each of these companies undertook to build a mill, only Lake Sulphite actually started work and it went into bankruptcy before the mill was completed. None of the concessions had been cancelled, however, and some companies, it was alleged, were making use of the valuable rights to export pulpwood. The minority report recommends a judicial enquiry into the whole Lake Sulphite situation.

Both reports discuss the question of policy on export of pulpwood, the majority report stating that there should be "full and absolute regard for the competition which has existed" and that export of pulpwood should at no time prejudice the position of Ontario mills, nor should it create economic disturbance or unemployment and recommends that the Department of Lands and Forests, in permitting the export of pulpwood, should be subject to review at least every year. Such review should be made with due regard for domestic and foreign conditions in the pulpwood markets.

The minority report claims that there should be a careful and comprehensive investigation of the effects of exports on the Canadian industry and that this should be carried out by independent experts.



Why Are So Many Mills Putting In BIRD SAVE-ALLS?

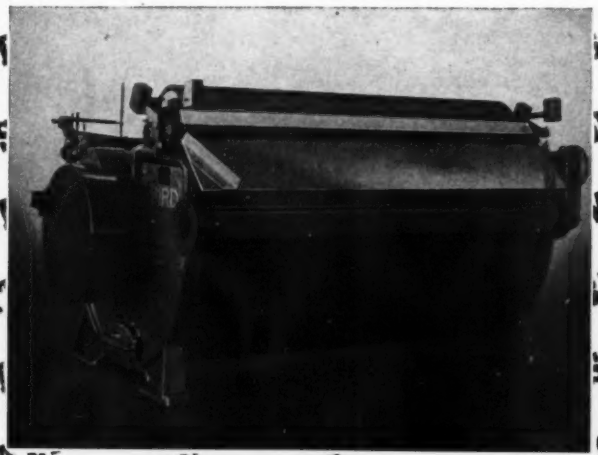
You know the answer.

With pulp at a premium, no mill can bear to see good papermaking stock go to waste.

The Bird Save-All gets the stock out of the waste water and into production at such low cost you can't afford to let it go, now, of all times.

Let us figure the net return on the investment in your case.

BIRD MACHINE COMPANY
SOUTH WALPOLE · MASSACHUSETTS



Take a Look AT THIS

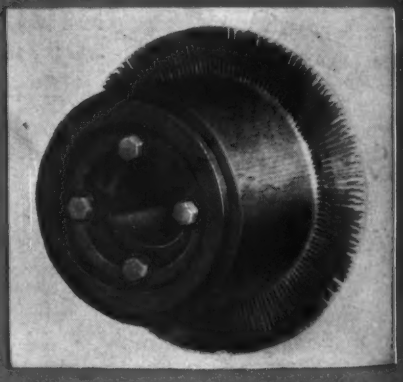
It's ONE REASON Why Our New D-c Motors Are So Dependable, and So Economical

TYPE CD HEAVY-DUTY D-C MOTOR
10 hp, and larger, 300/1200 rpm adjustable speed
50 hp, and larger, 1150 rpm

This improved brush rigging is but one of many new features in General Electric direct-current motors. Its simple construction assures positive contact, does away with sticky brushes, and gives stable operation. The illustration shows clearly its rigid, sturdy construction—why it contributes to economical year round motor performance.

Our attention to design detail, together with the use of the latest methods and materials—from the inside out—gives you d-c motors qualified better than ever to fill the needs of your industry. The over-all design of the open motor makes it readily adaptable for use even on jobs that have natural hazards to motor life; it not only safeguards the motor parts, but also makes for safer working conditions.

Our local office will be glad to discuss with you the many advantages that the new features of this outstanding motor will give you in your stepped-up production program. Or ask for bulletin GEA-1868B. General Electric Company, Schenectady, New York.



The commutator and the brush rigging depend upon the reliability of each other. Each is vital to the life and service of the motor as a whole. In a G-E motor you get a commutator that is a perfectly tight unit, unsurpassed in the quality of the copper and mica used. Its design provides for positive ventilation through the sleeve and for easy replacement of parts. Glyptal No. 1201 Red, applied to the end, provides a smooth, arc-resistant surface.

LOOK TO G.E. FOR D-C

BRUSH RIGGING...

ACCURATELY SHAPED BRUSH-HOLDER STUDS, of cold rolled steel, are always in the correct position, both circumferentially and radially, with respect to the commutator. Each stud fits into a milled slot in the brush-holder yoke and is pulled into position and held by the clamp bearing on its angle side.

STUDS ARE INSULATED FROM THE YOKE by an arc-resistant material which has been successfully used for high-voltage insulation in a wide variety of applications. It was adopted only after extensive laboratory tests made on it and other materials showed that it gives by far the best performance under all kinds of conditions. It does not carbonize and form a conducting path. Formed under heat and pressure to the shape of the stud, it provides a uniform insulating sleeve clear through the yoke.

COMMUTATOR CONTACT IS ALWAYS MAINTAINED through at least one brush on each of the four studs. The double brush holder of cast brass carries two brushes per stud, which gives much better riding qualities than a single brush of double thickness, and it is easily adjustable for commutator wear. With double brushes, commutation limits are increased and higher current densities in the brush are used. The heavy cast-brass holder assists in carrying away brush heat. It is easy to change or adjust brushes because the cast-brass brush holder resists corrosion, thereby preventing brushes from sticking; brushes ride freely in the holder and will literally come out with a flip of the wrist. The individual strands of the flexible pigtails of the brushes are lead coated to give positive corrosion resistance.

BRUSH PRESSURE ON THE COMMUTATOR IS MAINTAINED equally on both brushes by means of a double-action spring. If for any reason vibration should cause a brush to jump, the upward action of the moving brush exerts additional pressure on its mate, thereby assuring continuous brush contact with the commutator.

Spring pressure is transmitted to brushes through a hub-and-pressure-finger assembly mounted on a brass bearing pin — the hub supports and maintains spring alignment — and brush pressure is readily adjustable to any of five pressures by means of extended spring arms which are moved easily to various catch positions on the hub.

GENERAL ELECTRIC

Chicago Reports Strong Upward Paper Trend

Many Lines of Paper Included In Accelerated Demand With Higher Grades of Waste Paper Showing Marked Strength—Safety Meeting To Be Held At Sherman Hotel, May 6-8 — Other News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., April 21, 1941—Close observers of the local paper market are of the opinion that the upward trend in local markets should be sufficiently developed within the next ten days or two weeks to create a very strong market. From all sides come indications that any stock in prevalent quotations must soon be taken up. Sulphites were reported very strong this week with demand broadening daily. Groundwoods jumped into a better position than last week with demand spurting as the situation in competitive spots is being ironed out by the strength of these latter factors. Newsprints are strong while bonds and ledgers in general moved to the top on the list. Krafts continued in excellent fashion while paper board conditions were excellent. Waste papers were strong to very strong, particularly in the better grades of waste.

Plan Midwest Safety Conference

The 19th annual Midwest Safety Conference, which annually attracts many paper mill executives, especially from the Wisconsin and Michigan areas, will be held in Chicago on May 6, 7 and 8. All sessions will be held at the Sherman Hotel under the auspices of the Midwest Safety Council and other cooperating associations.

The schedule of sessions, which get under way Tuesday morning, May 6, includes well developed programs on Industrial Safety, Fire Prevention, Public Safety, First Aid in National Defense, Off the Job Accidents; Industrial Hygiene and Commercial Vehicle Operations. Panel discussions, moving pictures and debates will be utilized to develop interest in the many discussions. J. J. Plzak, claims manager of the Consolidated Water Power and Paper Company of Wisconsin Rapids, appears on the program on May 7 in conjunction with an Industrial Safety conference on maintaining interest. Mr. Plzak will be one of the participants in a panel discussion on plant accident prevention programs and maintaining interest through special activities.

A safety exhibit will be held in conjunction with the Conference with sixty exhibitors presenting accident prevention products and safety programs.

Tribune Gets Lake Newsprint Shipment

Great Lakes shipping opened up during the last week with the news that a cargo of 3000 tons of newsprint reached Chicago from Thorold, Ontario. The newsprint carrier traveled across Lake Erie, through Lake St. Clair and the St. Clair River, Lake Huron and the Straits of Mackinac and down Lake Michigan to the Chicago docks. The 880 mile trip was made by the Chicago Tribune carrier which will have three ships transporting paper to this city from the Ontario Paper Company. Other ships will transport pulpwood from the Ontario forest to the mills at Thorold.

Salesmen Attend Hillyer Services

Chicago paper executives, including a wide circle of friends in the selling end of the business, this week mourned the sudden death of Jack Hillyer, veteran sales executive of the Whitaker Paper Company. Mr. Hillyer, who was vice president in charge of the Chicago division of the Whitaker organization was stricken with a heart attack while playing golf last Friday afternoon, April 11. He died almost immediately. The funeral was held on April 14. The Monday meeting of the Salesmens Association of the Paper Industry was shortened and the group journeyed in a group to attend the services of one who was a most popular member and for many years active in the work of the Association.

New Strathmore Series Popular

Popular in the Chicago paper market is the new Business Series of the Strathmore Paper Company now being circulated through local distributors. This new series of Strathmore mailing pieces has been designed to help printers do a creative job of selling and Volume 1 is dedicated to getting "New Business for the Retail Store". It features suggestions for store folders which come up every month in the year.

Wage Agreements Renewed

TORONTO, Ont., April 21, 1941—A number of paper mills renewed wage agreements here today on mutually satisfactory terms, according to an official statement issued jointly by representatives of the workers and employers, who have been in conference this week. The statement follows:

"A conference was held today between the international union representing the workers in the mills of the Abitibi Power and Paper Company and subsidiary companies; the Great Lakes Paper Company; the Spruce Falls Power and Paper Company; the Ontario Paper Company and the Provincial Paper Company, Port Arthur division, and reresentatives of the companies mentioned, as well as Kenora and Fort Francis Mills.

"Labor agreements were renewed on a mutually satisfactory basis which will remain in effect until May 1, 1942. Consideration was given by the companies to possible increases in the cost of living and agreement was arrived at covering additional remuneration to employees to compensate for such increase."

Arthur Huggins, of Albany, N. Y., president of the International Brotherhood of Papermakers, and J. P. Burke, of Fort Edward, N. Y., president of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, were in Toronto to participate in the conference and to confer with the Machinists' Union.

Hon. Norman McLarty, federal minister of labor, has stated that the pulp and paper industry has been brought within the scope of the Industrial Disputes Investigation Act and that the importance of the pulp and paper industry to the war effort could be seen in the fact it produced annually about $240,000,000 in United States funds through exports.

New Type of Rubber Hose

As a result of its latest development in hose construction, the Manhattan Rubber Manufacturing Division, Passaic, N. J., has announced the introduction of Condor Homo-Flex Hose, which is claimed to combine balance, homogeneity, and flexibility to a high degree.

According to the manufacturer the exclusive Homo-Flex principle of balanced engineered construction was first applied to conveyor belts. Because of the unusual service and high tonnage records resulting on all types of conveying jobs, Manhattan engineers experimented in applying this principle in the design of hose. After months of experiments and exhaustive field tests under the most severe conditions, the Condor Homo-Flex Hose line was developed.

Among the advantages claimed for this hose are: extreme flexibility, lightness in weight, ease of handling, inseparable covers and plies, uniform diameters, and less elongation and expansion. Condor Homo-Flex is manufactured in 50-foot lengths on accurate steel mandrels in several types that cover a wide variety of service. Among these are air hose, water hose, high pressure orchard spray hose, mine spraying hose, air-oil and oil spray hose, and steam pressing iron hose.

Frank M. Belden Dead

MANHASSET, L. I., April 22, 1941—Frank M. Belden, a retired New York paper manufacturer who was a classmate of President Calvin Coolidge and United States Senator Dwight W. Morrow at Amherst College, died yesterday in the Nassau Hospital, Mineola, of complications which developed during an illness of seven weeks.

Mr. Belden, who had resided in Plandome for the last thirty years, attended Adelphi School in Brooklyn before entering Amherst, where he received his A. B. in 1895. In the World War he served in France with the Y. M. C. A. His business address during his active years was 302 Broadway, New York.

An ardent yachtsman and golfer, Mr. Belden belonged to the Plandome Field and Marine Club, Manhasset Bay Yacht Club and North Hempstead Country Club of Port Washington. He leaves a widow, Helen Washburn Belden, and two daughters, Mrs. Allen Clark and Miss Virginia Belden.

British Trade Directory

The 55th annual edition of "The Paper Trade Diary Directory of Great Britain, India and the Dominions" has just been issued by Trade Journals, Ltd., 8 Baldwins Gardens, London, E.C.1, England. The price is 3 shillings a copy. The 1941 issue is a comprehensive handbook of the paper trade within its field.

The listing of paper and board mills covers manufacturers in England, Ireland, Scotland, Wales and the Dominions. Paper and pulp mills in Canada, Nova Scotia and Newfoundland are also given.

Liquid Rubber Pulley Coating

Announcement has just been made by the Nonslip Pulley Covering Company, Buffalo, N. Y. of the development of a product known as "Nonslip Rubberpull". This product is supplied in a liquid form in convenient containers and is readily and easily

APPLYING NONSLIP RUBBERPULL

applied with a brush to the face of any pulley, flat or V-type, for the purpose of preventing belt slippage.

Tests which have been made demonstrate that Nonslip Rubberpull increases the efficiency of belt drives as much as 50 per cent.

Further information on Nonslip Rubberpull may be obtained by sending a post card direct to the Nonslip Pulley Covering Company, 777 Hertel avenue, Buffalo, N. Y.

New Greene, Tweed Packing

A high-pressure spiral packing is now available with the outer layer impregnated with lubricant forced into the packing by a special hot pressure process. The lubricant used is genuine Palmetto graphite grease, which has proven outstandingly successful in the well-known Palmetto braided packing.

Palmetto high-pressure spiral packing is made of closely woven asbestos cloth with center block laid up against a flat strip of heat-resisting resilient red rubber. The cover or wear face is firmly bonded to the center to make a strong square cornered packing. The packing is spiraled on a mandrel and vulcanized so that it retains its shape, and the exclusive lubricating process is then applied.

The resulting construction combines ruggedness and resilience which withstands mis-alignment and lubrication which reduces wear on the rod or shaft, and prolongs the life of the packing.

Palmetto spiral asbestos packing is specially adapted for reciprocating rods and plungers of steam engines and pumps, air and gas compressors, and various special machinery. The packing is regularly furnished in standard 12½-foot spirals. Additional information can be obtained by addressing the manufacturer, Greene, Tweed & Co., 101 Park avenue, N. Y. C.

J. K. Moffitt Made Doctor of Laws

At the University of California's Charter Day exercises, held March 27 in the Greek Theatre on the Berkeley Campus, James K. Moffitt, San Francisco civic leader and president of the pioneer paper house of Blake, Moffitt & Towne received an honorary degree of Doctor of Laws. The only other recipient of the degree on this occasion was Thomas Mann, distinguished scholar, former Nobel prize winner and exiled German author, presently lecturing at Princeton University.

President Robert Gordon Sproul, in conferring the degree upon Mr. Moffitt, characterized him in the following words; "A Californian in the fullest sense of the term—son of pioneers and of this University, which he has served superbly for three decades as one of its most devoted regents; one who in his simplicity, integrity and loyalty, embodies the finest traditions of American democracy; a citizen ever seeking the public weal yet shrinking from public recognition; a scholar whose culture and discrimination are living proof of the imperishable values of the traditional classical education; a philanthropist who abhors waste yet is generous to a fault; his alma mater is proud of a son whose breadth of interest, unselfishness and devotion set a standard for all our citizens."

A graduate of the University, class of 1886, Mr. Moffitt has long devoted his energies toward its growth and development, serving as a member of the Board of Regents for over thirty years, the longest term on record. During his college days he was a member of the football team. Since graduation, he has served as president of the Alumni Association and has been a generous contributor to his alma mater, his chief interest being the University Library.

Typical of his civic leadership is his recent election to the presidency of the Community Chest of San Francisco, an organization he helped found almost 20 years ago and for which he has served a number of years as treasurer and chairman of the Finance Committee.

Son of one of the founders of Blake, Moffitt & Towne, Mr. Moffitt is president of this pioneer organization of paper merchants, now in its 86th year and which today serves the Pacific Coast trade through 16 divisions and branches. In addition to his interests in the paper business, Mr. Moffitt has long been identified with the banking world and is chairman of the board of the Crocker First National Bank of San Francisco.

Spaulding and Moberg Join T. P. A.

Tested Papers of America, Inc., 230 Michigan avenue, Chicago, Ill., announces that Chet Spaulding and Donald Moberg have joined the organization.

Mr. Spaulding who joined the staff on April 1 was formerly associated with the National Paper Trade Association. Mr. Moberg who entered the organization in March, was connected with the Great Atlantic and Pacific Tea Company for the last sixteen years.

In commenting on the progress of Tested Papers since it was formed a little over one year ago, Frank Vaughan, president, states that, despite handicaps presented by the national emergency, excellent progress is being made and sales reflect a steady expansion.

Cincinnati Multi-V Belts

The Cincinnati Rubber Manufacturing Company, Cincinnati, Ohio, has entered the field of multiple V belts and can supply all standard sizes as regularly required for multiple V drives. Cincinnati V belts are modern belts for transmitting power on multiple V drives, providing a well-balanced drive, smooth running, efficient handling of the power load and uniform construction of every belt in each set.

The construction of Cincinnati V belts contributes definite advantages to smooth running, long life, and resistance to belt fatigue. A heavy, elastic fabric envelope takes up the outside wear, permits ready flexing and holds tightly to the groove. The load is carried by a cord section of high tensile, low stretch cords thoroughly impregnated with liquid rubber and then imbedded in a cushion of rubber providing lengthwise flexibility and easy flexing around the pulleys.

Uniform cross sections enable each belt to seat itself perfectly in the groove. Each belt is matched so that it will carry its equal share of the load.

Cincinnati V belts are offered with the assurance of giving the operator long and satisfactory service. Shipments of all sizes are made promptly. A descriptive circular may be had on application.

Fritz Becker Given Luncheon

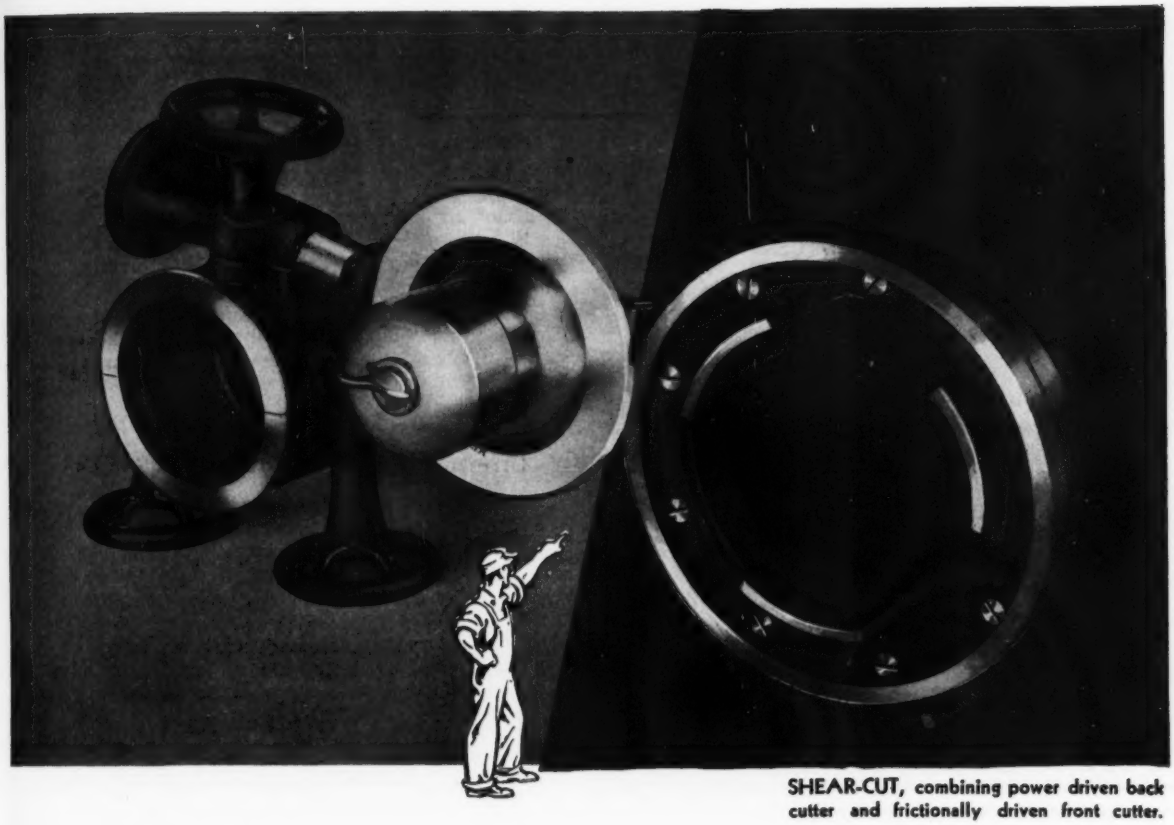
Fritz K. Becker, vice president in charge of sales for the Bird Machine Company, South Walpole, Mass., was tendered a surprise luncheon party on April 17, 1941, by the directors and members of the staff of the Bird Machine Company to celebrate Mr. Becker's twenty-fifth year with the company.

The party was held at the Lafayette House in nearby Foxboro, Mass. Mr. Charles Sumner Bird, chairman of the board, was master of ceremonies and made remarks appropriate to the occasion. Mr. Becker was presented with a gold wrist watch, Mr. Phillips Dennett, president of the company, making the presentation and sketching orally the high spots in Mr. Becker's career since he joined the Bird Machine Company on April 17, 1916.

The guest of honor also received a testimonial scroll containing the names of eighty people who have been employed by the Bird Machine Company for ten years or more.

Demand for Flax Straw Expands

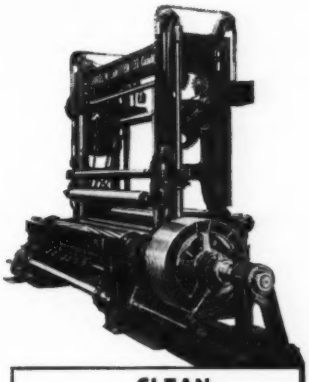
A press dispatch from Minneapolis says: "A new industry is springing up in Minnesota because of the European war. German occupation of northern France cut off the American tobacco industry from its source of cigarette papers. Cigarette manufacturers turned the problem over to research experts, who discovered that cigarette paper could be made from flax straw. The French had used linen rags. Minnesota is the nation's leading flax producer. Consequently six Minnesota tow mills are operating twenty-four hours a day to meet a sudden demand for the by-product."

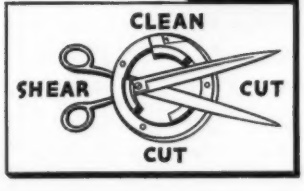


SHEAR-CUT, combining power driven back cutter and frictionally driven front cutter.

MANUFACTURERS and converters who seek lower repair and maintenance costs with improved quality of product, will be interested in Langston Slitter and Roll Winder performance records. There is a type and size for every job.

Shown at right is the Type DA in standard construction, built 82" to 132" wide; Heavy Duty, 132" to 172" wide and the Extra Heavy Duty 172" to 265". Speeds up to 3000 feet per minute. Drive illustrated is Vari-speed Clutch Pulley grooved for "V" Belt. Direct connected motor; variable speed through variable voltage with automatic tension control. Any desired drive suitable for operating speed and character of work, can be provided. Let us study your requirements and suggest the type of Langston you need.





SAMUEL M. LANGSTON COMPANY, Camden, N. J.

LANGSTON

Slitters

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending April 23, 1941

	High	Low	Last
A. P. W.	1½	1½	1½
Armstrong Cork Co.	27⅛	26¾	26⅞
Celotex Corp.	9½	9⅛	9½
Celotex Corp., pf.	70	68½	69½
Certain-Teed Products Corp.	3¼	3⅛	3⅛
Certain-Teed Products Corp., pf.	25¾	22⅞	24¾
Champion Paper & Fibre Co.	17¾	17¾	17¾
Champion Paper & Fibre Co., pf.	....	....	....
Congoleum-Nairn Co.	15¼	14⅜	14¾
Container Corp. of America	13⅜	13	13
Continental-Diamond Fibre Co.	7⅞	7⅝	7⅝
Crown-Zellerbach Co.	12¼	11¼	11⅜
Crown-Zellerbach Co., pf.	85	82⅝	83
Flintkote Co.	12½	12⅛	12¼
Robert Gair	1⅜	1⅛	1¼
Robert Gair, pf.	8¼	7⅜	7⅞
International Paper & Power	14	12½	14
International Paper & Power, pf.	64¼	62⅝	64
Johns-Manville Corp.	57½	54½	57½
Johns-Manville Corp., pf.	126¾	126¾	126¾
Kimberly Clark Corp.	27	27	27
MacAndrews & Forbes,	27	26	26
MacAndrews & Forbes, pf.	....	....	....
Masonite Corp.	21½	20¼	20¼
Mead Corp.	7⅝	7½	7½
Mead Corp., pf.	....	....	....
Paraffine Companies, Inc.	27⅛	27	27
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	12	11½	11⅝
Rayonier, Inc., pf.	23⅝	23⅛	23⅜
Ruberoid Co.	16½	15½	15½
Scott Paper Co.	38½	37½	38½
Scott Paper Co., pf.	113⅛	111⅞	112
Sutherland Paper Co.	20¼	19	19
Union Bag & Paper Corp.	10¾	10⅛	10⅜
United Paperboard Co.	2⅝	2⅜	2⅜
U. S. Gypsum Co.	58⅞	56½	56½
U. S. Gypsum Co., pf.	170	170	170

New York Curb Exchange

High, Low and Last for Week Ending April 23, 1941

	High	Low	Last
American Box Board Co.	4⅜	4¼	4¼
Brown Co., pf.	....	....	....
Great Northern Paper	40½	39¼	39¼
Hummel-Ross Fibre Corp.	5⅜	5¼	5⅜
National Container Corp.	11½	11⅛	11⅛
St. Regis Paper Co.	2	1¾	1¾
St. Regis Paper Co., pf.	82¼	80	82¼
Taggart Corp.	2⅜	2⅜	2⅜

M. & O. Earns $781,232

Net income after payment of bond interest of the Minnesota and Ontario Paper company and subsidiary companies, excluding European companies and the National Pole and Treating company for the year ending December 31, 1940 was $781,232.23.

This is reported in the consolidated income and profit and loss statement for 1940, released April 16 by R. H. M. Robinson, president of the Minnesota and Ontario Paper company.

Net sales, including railroad revenue, totalled $17,598,264.33. Cost of sales was $14,067,980.64, leaving a gross profit on sales of $3,530,283.69. Selling, administrative and general expense was $1,829,534.47, making the net profit on sales $1,700,749.22. Other income netted $37,563.70.

Loss on disposition and retirement of physical properties was $254,995.05. Provision for income and excess profits taxes totalled $92,085.64. Net income before bond interest but after depreciation and depletion charges of $1,386,387.19 was $1,391,232.23. Interest on Income Mortgage Bonds for 1940 was $610,000.00.

The books of account of the Trustees of Minnesota and Ontario Paper company, Debtor, and of the subsidiary companies of the Debtor, excluding European companies, as well as the National Pole and Treating company, are being audited as of the close of business on Feb. 28, 1941, date of transfer of properties to this company, according to President Robinson.

Following completion of this audit and in the early part of May, it is proposed to submit to the security holders of this company a consolidated balance sheet of this Company and of its subsidiaries, excluding European companies and the National Pole and Treating company, as at the close of business on March 31, 1941, together with an income and profit and loss statement for the three months ended March 31, 1941, he said.

International Paper Nets $15,795,648

The International Paper Company, which is controlled by International Paper and Power Company (only seven-tenths of one per cent of the preferred stocks of International Paper Company, and only three one-hundredths of one per cent of its common stock are held by the public), has reported for 1940 a consolidated net income of $15,795,648 after charges, taxes and reserves. This result is equal, after annual dividend requirements on two preferred stock issues which carry dividend arrears, to $8.96 each on the 1,000,000 shares of common stock. It compares with $5,090,465, or $5.30 each, on 960,847 shares of 7 per cent preferred stock in 1939.

Current assets at the end of the year amounted to $62,876,899 and current liabilities were $22,278,834, compared with $49,076,553 and $13,217,260, respectively, twelve months previously. Cash held by the companies operating in the United States amounted to $12,339,809, while the same item for the Canadian and foreign companies, in terms of United States currency, was $5,556,588.

The report disclosed that on Jan. 1, 1940, the companies in Canada changed their depreciation policy to those permitted for Dominion income-tax purposes, and, as a result, charges to consolidated profit last year for depreciation and obsolescence were about $4,600,000 more than they would have been had these companies followed the same procedures of 1939.

In 1940 the company and its subsidiaries produced 2,275,001 tons of paper, paperboard and pulp, compared with 1,768,920 in 1939.

Nekoosa-Edwards Votes Dividend

A dividend of $2.00 per share on the capital stock of the company was declared by the board of directors of the Nekoosa-Edwards Paper Company last week, according to John E. Alexander, president. The dividend was declared payable in quarterly installments on May 10, June 30, September 30 and December 31, 1941.

Container Corp. Earns Less

Net profit of the Container Corporation of America for the three month period ending March 31, 1941 amounted to $497,042 equal to $.64 per share after all charges including interest, depreciation, re-

"The Situation Is Under Control"

"The Marines have landed and the situation is under control". How often during emergencies Americans have thrilled to that report!

In the field of white and light-tinted paper stocks TITANOX pigments are like the marines because they take complete control of the problems which arise in making paper opaque and bright. And TITANOX pigments improve the qualities of such types of paper from thin tissues to the heavy packaging stocks and coated printing papers.

If you are hesitating for *any* reason to use TITANOX pigments in *any* of your white and light-colored products, you may find consultation with our Service Department advantageous.

WHITE PAPER PIGMENTS

TITANOX-A (titanium dioxide) most opaque of all white pigments.

TITANOX-B-30 (titanium barium pigment) as a filler or coating pigment.

TITANOX-C (titanium calcium pigment) for coating.

OPACITY
WHITENESS
BRIGHTNESS

TITANOX
REG. U.S. PAT. OFF.

TITANOX
TRADE MARK

Technical service is freely offered in relation to all white pigment problems.

TITANIUM PIGMENT CORPORATION
SOLE SALES AGENT
111 Broadway, New York, N.Y. • 104 South Michigan Avenue, Chicago, Ill. • National Lead Company, (Pacific Coast Branch) 2240 24th Street, San Francisco, California

serves for year-end adjustments and provisions for Federal income and excess profits taxes.

Earnings after 24% Federal income tax but before Federal excess profits tax amounted to $563,122 or $.72 per share which compares with earnings of $472,418 or $.60 per share for the corresponding period in 1940.

Shipments for the three month period totaled $8,071,000 or an increase of 24.6% over the same period in the previous year.

Puget Sound Declares Dividend

A dividend of 50c a share on the common stock of Puget Sound Pulp and Timber Company, payable April 29, 1941 to holders of record April 25 was declared today.

At the annual meeting of the stockholders of the company held at Bellingham, Washington, April 15, 1941, all incumbent directors were reelected and the board reappointed the officers for the coming year. The board of directors is composed of Ossian Anderson, president, Robert H. Evans, Wm. C. Keyes, Ralph H. Miller, Harry M. Robbins, vice-presidents, Jasper L. Rucker and Fred G. Stevenot. L. Turcotte is secretary-treasurer.

Paraffine Nets $350,294

The Paraffine Companies, Inc., and subsidiaries for the March quarter, reports a net profit of $350,294, equal after dividend requirements on 4% cumulative convertible preferred stock to 69 cents each on 470,062 common shares, against $282,077 or 54 cents a common share in preceding quarter and $361,874 or 71 cents a share on common in March quarter a year ago. Nine months to March 31: Net profit, $1,023,820 or $2 a common share, against $1,317,501 or $2.62 a share for the nine months to March 31, 1940. Interim quarterly earnings are subject to final audit and include company's proportion of earnings of companies in which more than 50% of the voting stock is owned, but include only dividends received from Fibreboard Products, Inc., in which 50% of the voting stock is owned.

Kimberly-Clark Nets $516,105

The Kimberly-Clark Corporation last week reported net income before dividends of $516,105 for the first quarter of 1941. This brought the figure for the twelve months ended March 31 to $2,143,829.

Net sales for the first quarter amounted to $7,708,944 and for the twelve months came to $29,646,755. Cost of sales in the two cases were $6,357,846 and $24,150,564.

Provisions for dividends on preferred stock during the quarter were $149,445, and for the twelve months, $597,780. Net profit on common stock amounted to $366,660 and $1,452,769, respectively.

Profit per share was 75 cents for the quarter compared with $1.22 for the first quarter of 1940, and $2.97 for the twelve months' period compared with $4.51 in the previous twelve months.

Soundview Net Loses

The Soundview Pulp Company for the March quarter reports a net income of $489,417, or 94 cents a share, against $537,036, or $1.03 a share, last year.

Southern Kraft Nets $11,942,341

The Southern Kraft Corporation reports for 1940 a net profit, after provision for doubtful accounts, interest, amortization of debt, discount and expense, depletion and other charges, of $11,942,341.87, compared with net profit in 1939 of $2,539,001. The statement of profit and loss and earned surplus follows:—

Statement of Profit and Loss and Earned Surplus
For Year Ended December 31, 1940

SALES AND OTHER INCOME:			
Gross sales, less returns, allowances and discounts—			
Customers	$66,253,097.04		
Affiliated companies (see note 8)	7,598,756.20	$73,851,853.24	
Other income—net (see summary)		14,815.57	$73,866,668.81
COST AND EXPENSES:			
Cost of sales—			
Pulpwood, labor, materials, etc. (see note 6)		$33,630,370.58	
Maintenance and repairs		4,950,082.67	
Taxes (other than income taxes)		1,303,353.07	
Outward freight and delivery expenses		8,746,422.00	
Selling, general and administrative expenses (see note 6)		2,462,334.13	
Provision for doubtful accounts		300,000.00	51,392,562.45
			$22,474,106.36
DEDUCTIONS:			
Interest to public—funded debt		$ 558,247.31	
Interest to parent company—			
Funded debt	$ 542,341.18		
Income notes	1,393,417.30		
Other debt	17,125.25	1,952,883.73	
Amortization of debt discount and expense		69,215.26	
Depreciation (see note 7)		1,731,041.58	
Depletion		198,385.61	
Provision for income and excess profits taxes—			
Federal (including excess profits taxes of $1,577,182.00)		5,543,173.00	
State		478,818.00	10,531,764.49
NET PROFIT			$11,942,341.87
EARNED SURPLUS—JANUARY 1, 1940			4,743,524.50
PROFIT ON BONDS REDEEMED			2,249.63
EARNED SURPLUS—DECEMBER 31, 1940			$16,688,116.00

Mead Nets $362,037

The Mead Corporation and subsidiaries for the twelve weeks to March 22 reports an audited net profit of $362,037, equal after preferred dividend requirements to 41 cents each on 625,000 shares of no-par value common stock, against $357,511, or 40 cents a share, on 619,374 common shares for the twelve weeks to March 23, 1940. Net sales were $6,570,166, against $5,614,615.

Celotex Votes Dividend

Celotex Corp. has declared an extra dividend of 12½ cents and quarterly dividend of 25 cents on the common stock. Extra is payable May 10 and quarterly is payable May 1 both to holders of record April 26. A 25 cent payment was made Feb. 4, the first cash dividend on the common since Oct. 1937.

Port Huron Earns $171,228

The Port Huron Sulphite and Paper Company for the year to January 31: reports a net income of $171,228, against $163,929 in previous fiscal year. Net sales, $2,790,133, against $2,645,138.

Chemical Paper Profits Off

The Chemical Paper Manufacturing Company for 1940 reports a net income of $98,376, compared with $117,831 in 1939; net sales, $2,588,577, against $2,304,799.

CONSTRUCTION NEWS

Buffalo, N. Y.—The United States Corrugated Fibre Box Company, Inc., 180 Hopkins street, manufacturer of corrugated boxes and containers, has awarded contract to the Austin Company, 16112 Euclid avenue, Cleveland, Ohio, engineer and contractor, for the design and construction of new addition to plant. It will be one-story, about 80 x 300 feet, used for expansion in production, storage and distributing departments. Cost reported close to $100,000, including equipment. Work is scheduled to begin soon.

Richmond, Va. — Morgan Brothers, Belleville and Moore streets, Richmond, manufacturers of paper bags and containers, have plans in progress for new addition to plant, consisting of a one-story structure, 20 x 142 feet, estimated to cost over $50,000, including equipment. E. Tucker Carlton, 2602 Prince George road, is architect. Bids are scheduled to be asked on general erection contract at early date.

Bogalusa, La.—The Gaylord Container Corporation, Pulp and Paper Division, manufacturer of corrugating paper, wrapping paper, paper board products, etc., has approved plans for new one-story addition to mill at Bogalusa, to be used for expansion in storage and distributing departments. Award for structural steel framing has been let to the Ingalls Iron Works Company, Birmingham, Ala. Cost reported over $75,000, including equipment. This is part of an expansion program now being carried out at mill, previously referred to in these columns, entire project to represent a gross investment of close to $5,000,000. Main offices are at 2820 South Eleventh street, St. Louis, Mo.

Los Angeles, Cal.—The Fibreboard Products, Inc., Russ Building, San Francisco, manufacturer of paper board stocks, bristol board, wall board, etc., has taken out a permit for one-story addition to mill at 4444 Pacific boulevard, Vernon district, to be used for storage and distribution. Cost reported at close to $25,000 with equipment. Award for erection has been let to MacIsaac & Menke, Inc., 3445 Union Pacific avenue, Los Angeles.

Tonawanda, N. Y.—The Spaulding Fibre Company, Inc., manufacturer of insulating papers and kindred paper stocks, has approved plans for new addition to mill, to be one-story, about 65 x 90 ft. Cost reported close to $40,000, including equipment. General erection contract has been awarded to Balling Brothers, 401 Bennett street, Tonawanda, and work will be placed under way at once.

Portland, Ore.—Fire, April 17, damaged a portion of plant of the Oregon Paper Box Company, manufacturer of paper boxes and containers, occupying part of building at 215-17 South West Stark street. Entire loss, divided among several companies occupying space in same building, is reported over $20,000. The damage will be replaced.

Oshkosh, Wis.—The Oshkosh Corrugated Box Manufacturing Company, Harrison and Murdock streets, manufacturer of corrugated boxes and containers, is pushing erection of new one-story addition to plant, 60 x 191 feet, and structure is now over 80 per cent completed. It will be used for increased capacity and equipment installation will begin at early date. Erection contract is being carried out by the Fluor Brothers Construction Company, 48 Otter street, Oshkosh, as previously noted in these columns. New structure is reported to cost $50,000, with equipment.

Chillicothe, Ohio—The Mead Corporation has plans nearing completion for new addition to mill, consisting of a one-story structure, about 93 x 96 ft., to be used for expansion in distribution and shipping department. Cost is estimated close to $30,000, with equipment. Work will be placed under way soon.

Polson, Mont.—J. E. Busey and I. R. Delaney, both of Polson, are interested in a project to construct and operate a pulp and paper mill on local site. Proposed plant will consist of several large one and multi-story units for ground wood, pulp and paper-making divisions, with power house, mechanical shops and auxiliary buildings. It is reported to cost over $2,500,000. A company will be organized to arrange financing and carry out the project. Others interested, similarly of Polson, are L. L. Marsh and Lloyd Helmer.

Los Angeles, Cal.—The Pioneer-Flintkote Company, 5500 South Alameda street, manufacturer of roofing papers, paper board and kindred paper stocks, has taken out a permit for proposed addition to mill, recently referred to in these columns, and work on superstructure will proceed at once. It will be one-story, 225 x 314 feet, and will be used for storage, distribution and other service. Cost estimated about $100,000, with equipment. Myers Brothers, 5407 San Fernando road, West Los Angeles, have the general erection contract. Parkinson & Parkinson, Title Insurance Building, Los Angeles, are architects.

Little Ferry, N. J.—The Flintkote Company, 30 Rockefeller Plaza, New York, N. Y., manufacturer of roofing papers, building and other paper stocks, has completed plans for one-story addition to branch mill at Little Ferry, to be used for expansion in production department. It is reported to cost over $75,000, with equipment. Award for structural steel framing has been made to the Oltmer Iron Works, 327 Manhattan avenue, Jersey City, N. J., and contract for general erection will be awarded at early date.

New Companies

New York, N. Y.—The Associated Container Corporation has been incorporated with capital of 100 shares of stock, no par value, to manufacture and deal in paper boxes and containers of various kinds. New company is represented by Jack Hirsch, 1450 Broadway, New York, attorney.

New York, N. Y.—The Topps Paper Box Corporation, New York, has been chartered with capital of $10,000, to manufacture and deal in paper boxes and containers. New company is represented by Robert R. Fingeroth, 17 John street, New York, attorney.

Townsend Harbor, Mass.—The Spaulding Fibre Company of Massachusetts, Inc., has been incorpor-

ated under State laws with capital of $50,000, as an affiliated interest of the Spaulding Fibre Company, Inc., Tonawanda, N. Y., manufacturer of insulating papers and other kindred stocks, to operate in Massachusetts. Rolland H. Spaulding is president; and Huntley N. Spaulding, treasurer, both occupying similar offices with parent organization.

New York, N. Y.—The Corrugated Box Institute of the Apparel Industry, Inc., has been incorporated with capital of $10,000, to represent interests engaged in the manufacture of corrugated shipping boxes and containers for the apparel industry. New organization is represented by Robbins Stationer, 25 Warren street, New York.

New York, N. Y.—The Century Waste Material Company, Inc., has been chartered with capital of 100 shares of stock, no par value, to deal in waste paper. New company is represented by Fred Canevari, Assembly Chamber, Albany, N. Y.

Westminster Co. To Expand

Approval of a new 20-year lease on the site of the Westminster Paper Company, Ltd., at New Westminster, B. C., to facilitate a $200,000 expansion of the plant was granted by the City Council at a special meeting when representatives of the company explained a request for the lease. The new lease will replace two existing leases, which have approximately nine years to run. The longer lease is required for financing of the project. The paper plant, which is located on the North Arm of the Fraser River, occupies Indian reserve property. The expansion plans call for installation of new paper-making machinery.

Westminster Paper Company, headed by J. J. Herb, has enjoyed a growing business for its various lines of paper specialties, and the proposed expansion is due to the need for increased facilities to produce in greater volume goods already being manufactured. It is not proposed to embark on any new lines of production, officials state.

It is probable that increased power will be sought and extension of the driers and other equipment will be carried out, the details to be announced at the annual meeting in the near future.

Westminster Paper Company's gross sales last year were $1,208,506, against $1,036,542 in the previous year. Net profit, after deductions for costs, depreciation and taxes, was $142,027.

Anglo American in Emergency Offices

Bowmall & Co., Inc., 250 Park avenue, New York, write:—"We received a cable from our associated, the Anglo American Pulp and Paper Company, Ltd., of London, England, informing us that their new offices, which they had taken at Sentinel House after their original offices were destroyed in the air raid on the Guildhall District on December 26, 1940, have been destroyed again during last night's biggest air raid on Central London. While in the first catastrophe the greatest part of the files and records could be saved, this time the whole contents of the office have been destroyed. The emergency quarters, pending the installment of new offices, are—For cables—c/o Modern Telephone Company, 139 Tottenham Court road, London. For letters—c/o Mr. Charles Marcus, The Guest House, Knebworth, Hertfordshire."

TO OPEN PAPER BIDS MAY 19

(Continued from page 9)

6,290,000 pounds machine-finish book paper.
670,000 pounds antique book paper.
600,000 pounds off-set book paper.
90,000 pounds lightweight machine-finish book paper.
240,000 pounds 50% rag antique book paper.
10,000 pounds 75% rag laid antique book paper.
20,000 pounds 100% rag antique book paper.
3,000,000 pounds supercalendered book paper.
1,570,000 pounds coated book paper.
80,000 pounds lithograph paper.
5,350,000 pounds mimeograph paper.
450,000 pounds U S M O safety writing paper.
5,000 pounds U S M O writing paper.
4,000 pounds safety writing paper.
10,500,000 pounds writing paper.
1,385,000 pounds map paper.
1,605,000 pounds manifold paper.
8,550,000 pounds bond paper.
1,601,000 pounds ledger paper.
1,450,000 pounds index paper.
4,500 pounds tissue paper.
685,000 pounds cover paper.
425,000 pounds manila paper.
1,105,000 pounds kraft paper.
2,000 pounds paraffin paper.
200,000 sheets gummed paper.
200,000 pounds blotting paper.
2,500 pounds stereotype molding paper.
30,000 pounds oiled manila tympan paper.
5,000 pounds plate-wiping paper.
5,000 pounds back-lining paper, for case making.
10,000 pounds high finish red sulphite.
70,000 pounds manila tag board.
900,000 pounds calendered tag board.
40,000 pounds manila cardboard.
160,000 sheets railroad board.
420,000 pounds bristol board.
6,000,000 pounds United States postal card bristol board.
28,000 sheets pressboard.
5,000 pounds news board.
1,212,000 pounds chip and strawboard.
20,000 pounds marble-grained board.
36,000 pounds box board.
460,000 pounds binder's board.

In cases where more than 1,000 reams are called for, proposals will be received for 1,000 reams or more.

Bids will be received for the following envelopes:
61,845,000 Kraft.
16,455,000 Writing, Sulphite, White and Colored.
415,000 100% Rag Writing, White and Colored.
695,000 100% Rag Ledger, White.
2,265,000 Bond, 50% Rag, White.
665,000 Bond, 100% Rag, White.

Government Paper Bids

WASHINGTON, D. C., April 23, 1941—Government Printing Office has received the following bids for 11,760 pounds (84,000 sheets) of 31½ x 48 wood manila paper; Cauthorne Paper Company, 4.93 cents; Old Dominion Paper Company, 5.097 cents; Whitaker Paper Company, 4.69 cents; Mudge Paper Company, 5.21 cents; and Barton, Duer & Koch Paper Company, 5.75 cents.

Obituary

Henry Edward Cook

Henry Edward Cook died on March 27, 1941. "Harry" Cook, as he was familiarly known, was connected with Blake, Moffit & Towne, for the past 45 years. He was recognized throughout the trade for his authoritative knowledge of paper, and it was under his guidance that many present Blake, Moffitt & Towne salesmen received their first training.

Born in Lawrence, Mass., in 1877, Mr. Cook came with his parents around the Horn to California when he was seven years of age. In October of 1896 he began his career in the paper business in the billing department of Blake, Moffitt & Towne, San Francisco. Following this he transferred his interests to merchandising activities. For a number of years he was in charge of the country sales, and more recently was connected with the city sales department.

His home was in Berkeley and he is survived by a widow, Mrs. Lydia C. Cook, and a daughter, Mrs. Joseph Blackett.

John T. Hillyer

Funeral services for John T. Hillyer, vice-president of the Whitaker Paper Company, were held at 2 P.M. in the chapel at 5501 North Ashland avenue, Chicago, Ill. Mr. Hillyer died of a heart attack Friday in the Park Ridge Country club. He was 58 years old and had lived in Chicago 18 years. He was Chicago manager for his company, as well as vice-president, and he was a former president of the Western Paper Merchants' association. His widow, Carrie, survives. The Hillyer home is at 4221 North Paulina street.

Harold T. Merriman

Harold T. Merriman, president of the American Wringer Company, died on April 10.

Mr. Merriman had been associated with the company for the past eighteen years.

Allan M. Fletcher

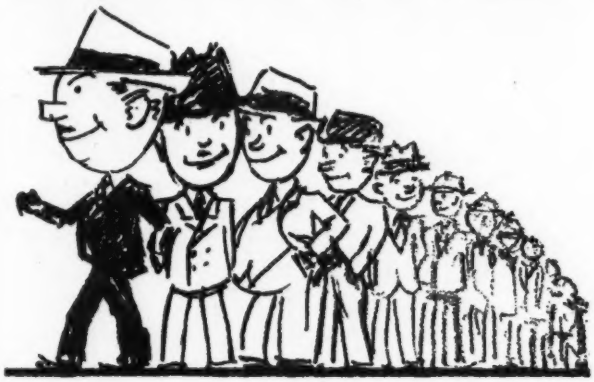
Allan Miller Fletcher, 83, president of the Fletcher Paper Company, Alpena, Mich., died on April 13.

Gabriel M. Prevost

Gabriel M. Prevost, superintendent of the Fletcher Paper Company, Alpena, Mich., died on March 10 at the age of 62.

Petition for Waterfalls Receivers

PORTLAND, Me., April 18, 1941—A petition for the appointment of receivers for the Waterfalls Paper Mills will be heard at 10 o'clock A.M., Thursday, April 24. It is said to be the desire of all parties connected with the Waterfalls Paper Mills that the plant be continued as a going concern, if possible, and negotiations are going on at the present looking toward that end. The bringing of the petition, it is said, is but one step in the process of placing matters in such orderly condition as to facilitate the carrying out of this purpose.



LOOK AT THE
LINE-UP
of CINCINNATI
RUBBER
COVERED ROLLS

Suction Press Rolls
Press Rolls
Couch Rolls
Coating Rolls
Top Rolls
Wormed Cutter Rolls
Wormed Felt Rolls
Striping Rolls
Table Rolls
Smoothing Rolls
Special Rubber Covered Rolls of every description.

THE CINCINNATI RUBBER MANUFACTURING CO.
CINCINNATI, OHIO

New TAPPI Members

The Executive Committee of the Technical Association of the Pulp and Paper Industry has elected the following to membership:

William R. Adams, resident manager, Taggart Corporation, Herrings, N. Y., a 1925 graduate of Union College and formerly with Robert E. Read, Inc., Dexter, N. Y.

Roger O. Benjamin, student, University of Maine, Orono, Me., a 1939 graduate of Cornell University.

Herman L. Berg, sales engineer, Bulkley, Dunton Pulp Company, New York, N. Y., a 1926 graduate of the University of Darmstadt and formerly with Fliesberg Akt., Stockholm, Sweden.

Howard J. Blake, paper mill superintendent, Morley Company, Portsmouth, N. H., a 1924 graduate of Northeastern University.

Theodore J. Bowes, chemist, Aqua Sec Corporation, New York, N. Y., a 1912 graduate of the University of Pennsylvania.

C. R. Breden, research chemist, Continental Can Company, Chicago, Ill., a 1930 graduate of Iowa State College and formerly with the Upjohn Co., Kalamazoo, Mich.

August W. Bremer, chemist, St. Joe Paper Company, Port St. Joe, Fla., attended the University of Florida.

Harry Burrell, research chemist, Heyden Chemical Corp., Garfield, N. J., a 1934 graduate of Newark College of Engineering and formerly with the Ellis-Foster Company, Montclair, N. J.

Joseph C. Harkness, research engineer, Johns-Manville Company, Inc., Manville, N. J., a 1940 graduate of Carnegie Institute of Technology.

Morris Huff, technical director, H. P. Smith Paper Company, Chicago, Ill., attended Crane Junior College and formerly with the Carbasite Corporation, Chicago, Ill.

Geoffrey F. Layne, chief engineer, Price Bros. & Co., Kenogami, P. Q., a 1914 graduate of McGill University and formerly with the Laurentide Company, Grand Mere, Quebec.

Frederic W. O'Neil, instructor, N. Y. S. College of Forestry, Syracuse, N. Y., has been transferred from the Associate to the Active grade.

Charles S. Maxwell, chemist, American Cyanamid Company, Stamford, Conn., a 1936 graduate of Syracuse University and formerly with the Oswego Falls Corporation, Fulton, N. Y.

B. Meesook, student, traveling fellowship in U.S.A., a 1937 graduate of Cambridge University.

Robert W. Miller, chemical engineer, Paper and Industrial Appliances, Inc., a 1938 graduate of Lawrence College and formerly with St. Regis Kraft Company, Tacoma, Wash.

Alfred H. Montville, refining foreman, Ecusta Paper Corporation, Pisgah Forest, N. C., attended Miami University and formerly with the Sorg Paper Company, Middletown, Ohio.

V. N. Morris, director of laboratories, Industrial Tape Corporation, New Brunswick, N. J., a 1926 graduate of the University of Minnesota.

John W. Potts, chemist, Fleming & Sons Inc., Dallas, Texas, a 1940 graduate of Texas A. & M. College.

Sam P. Robinson, technical superintendent, Brunswick Pulp and Paper Company, Brunswick, Ga., a 1933 graduate of the Mass. Institute of Technology and formerly with the Geiger-Robinson Canning Company, Jax, Fla.

Andrew Ryfun, student, N. Y. S. College of Forestry, Syracuse, N. Y.

Vincent J. Tranfaglia was formerly a chemist with the American Writing Paper Corporation, Holyoke, Mass. and a 1937 graduate of the Norwich University, is now a Lieutenant with the 4th Armored Regiment, 3rd Armored Div., Camp Polk, La.

A Non-Staining Packing

A non-staining packing is now available for apparatus handling liquids that must be kept unstained or uncontaminated. This packing, known as Klero, is snow white in color; and has an odorless, tasteless, edible and chemically-resistant lubricant. Being made of asbestos yarn, Klero packing is suitable for high temperatures. Its braid-over-braid construction prevents accumulation of solid materials in the packing. Klero packing has many applications in the food and drug industries, paper and pulp mills, ceramic plants, textile plants, and chemical process work, wherever graphite packings or packings with ordinary lubricants are undesirable. Klero packing is made by Greene, Tweed & Co., 101 Park avenue, New York City, manufacturers of Palmetto and other well known brands of packings. Full information, prices and working samples for test will be sent on request.

Ohio To Discuss Pigment Dispersion

The Ohio Section of the Technical Association of the Pulp and Paper Industry will hold its next regular meeting at the Hotel Manchester, Middletown, Ohio, on Thursday, May 1, 1941, at 6:30 P. M.

A technicolor motion picture will be shown on modern pigment dispersion. Kent Sprinkel, Hilton Davis Chemical Company, will talk about the manufacture of dyes, pigments, and intermediates, together with the flushing process for dispersing colors in varnishes, etc., and testing procedures.

All persons interested in this subject are welcome and should notify D. S. Brown, 222 South Broad street, Middletown, Ohio, that they will be present.

Delaware TAPPI to Discuss Sizing

The regular May meeting of the Delaware Valley Section of the Technical Association of the Pulp and Paper Industry will be held at the Engineers Club, 1317 Spruce street, Philadelphia on May 2, 1941 at 6:30 P.M.

A discussion on starches, covering the various uses of starch, beater and tub sizing, and adhesives will be led by J. P. Strasser of Stein-Hall Manufacturing Company.

Teale Flexible Slice

Benjamin E. Teale, Dalton, Mass., writes:—"In your report of the N. E. TAPPI quiz program in your current issue you report Mr. Chapman as stating 'that the Thiel slice gives good results'. I was present at the meeting and I understood him to say 'Teale' slice. I know of no 'Thiel' slice on the market. The Teale Flexible Slice (which I believe Mr. Champion had in mind) is manufactured by the E. D. Jones & Sons company of Pittsfield, Mass."

Indianapolis Improves

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., April 21, 1941—Business in virtually all the paper field continued to show the effect of improved general business conditions during the last week. In fact many executives and consumers say the market is more satisfactory than in many other lines. For one thing there has been no apparent shortages in any paper items. Buyers have been able to get all items they required and in the amounts they wanted them. Increase demand in many items has been experienced because of the large amount of defense work that has been centered in the state. Prices, while firm, have shown no indication of mounting unduly.

With the coming of spring, demand for newsprint has increased to some extent. The volume is considerably better than it was a year ago. Much the same is true of paper board and indications point to increased consumption of board products.

Demand for all sorts of building papers and roofing is at a high level and from all present indications will remain at high during the entire summer months. There was virtually no abatement of demand during the winter months and the spring got off to a flying start.

Orders and inquiries now are being received for summer specialties and if the summer is a warm one the demand should be heavy. Dealers generally carried small stocks over last winter and their initial orders were fairly heavy. Another burst of specialty buying is expected before the end of the month, after which time dealers likely will be out of the market until they have depleted their initial stocks. Many jobbers have attractive deals.

Increasing demand also is seen for waxed papers and containers. The dairy and ice cream trade is taking more than a year ago and prices are well held. Tissues were moving nicely and the same was true of kraft and allied products.

Fair demand for rags was seen in the local market last week, with roofing rags in particular demand. Paper stock continued firm in price.

TRADE AUTOMATIC MARK

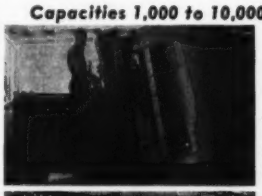
Manufacturers for Over Thirty Years

MODERN Electric Propelled INDUSTRIAL TRUCKS

FOR ECONOMICAL MATERIALS HANDLING

- LOW AND HIGH LIFT TRUCKS
- FORK TRUCKS
- PULP AND BALE HANDLERS
- PAPER ROLL HANDLERS
- LOAD CARRIERS
- TRACTORS — CRANES

Capacities 1,000 to 10,000 Lbs.



☆ Center-Control 3000 to 6000 lb. capacity motorized revolving paper roll handlers.

☆ Center-Control 6000 to 7000 lb. capacity heavy-duty, motorized revolving paper roll handlers.

☆ Box-car bale and roll unloader for single tier storage. 1500 to 2500 lbs.

☆ Box-cars can be loaded and unloaded in record time — with motorized roll upender. Capacities up to 3000 lbs.

☆ Chisel type pulp handlers for box-car loading, unloading and stacking.

☆ 6000 lb. capacity low-lift and high-lift trucks for skid transportation of small rolls and flat stock.

Heavy-duty, center-control fork trucks—telescopic tilting, tiering type for low-cost roll storage and transportation. Capacities 3000 to 6000 lbs.

Listed Under Reexamination Service of UNDERWRITERS' LABORATORIES

AUTOMATIC TRANSPORTATION CO.

78 W. 87th St. Div. of the Yale & Towne Mfg. Co. CHICAGO, ILL.

Kraft Pulp in Restricted Supply

BOSTON, Mass., April 21, 1941—The visible supply of kraft pulp is giving apprehension as to the supply of paper and so mills have withdrawn prices and wait until they are ready to make shipments before advising as to prices, it is stated here. The most kraft mills can do is to take care of their regular customers and make allotments. It is a sellers' market, not as respects price, but in order to protect the available supply.

Mills in the South have difficulty in transportation, particularly on boat lines. One line recently went out of business and another line was sold, with other points of delivery than formerly. Some shipments are being made to boat lines which connect with boat deliveries to New York. The situation is such that it may necessary to make shipments via "all rail", which means increased transportation costs.

In cases where it is uncertain what jobbers are to pay for paper, they hesitate as to placing orders, and prevents a runaway market and speculation.

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger
EDITOR

Vol. 112 April 24, 1941 No. 17

COMING EVENTS IN PAPER INDUSTRY

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

American Pulp and Paper Mill Superintendents Association, Twenty-second Annual Convention, Poland Spring House, Poland Spring, Me., June 17-19.

Technical Association of the Pulp and Paper Industry, Fall Meeting, Ann Arbor, Mich., September 16-19.

TAXES AND INFLATION

World-wide confusion arising from the complexity of political, social and economic forces, have created a background of uncertainty and fear for the future. The position of the United States is steadily becoming more belligerent and the outlook is unfavorable for a continuation of normal business conditions. The President has said that Americans in general appear unaware of the grave crisis faced by the nation. That may be true, but with so many unmistakable indications present in the news of the day of radical changes in the social and economic life of our country, it would seem that few persons can long be unaware of the changing status of the United States.

A controlled economy to adequately coordinate the management and use of national resources for defense, is now partially in effect. This country has not declared a state of hostility exists between it and any nation, but the regulation of prices and the setting up of priorities is certainly indicative that a national emergency exists. A different, less comfortable and less assuring way of life is to be our lot. More for defense and less for civilian requirements is the expectation for the future. This prospect should not be viewed with alarm but it is sensible to consider it as a serious condition, thrust upon us by a disordered Europe.

There is little doubt that the new taxes to be added in 1941 to meet the need for much higher revenue, will serve to inform even persons of limited intelligence that the cost of rearmament is very high. In the experiences gained in the former world conflict, waste and inefficiency are likely to be again repeated, perhaps on even a larger scale than formerly. But a high price must necessarily be paid under our liberal form of government for national security. It would be going too far to say that security would not be worth the high price. Nevertheless, huge expenditures creates anxiety for the future. In making some general observations on taxation and inflation Henry H. Heimann, executive manager of the National Association of Credit Men, declared in the association's monthly review of business of April 16, that, "Concern over taxation and inflation, and the heightened interest in such investment hedges as farm property ownership, are significantly noticeable throughout the country. "With the post-1929 deficits and the current defense program requirements, renewed attention to taxes and living costs is as desirable as it is understandable. The next few months will witness whether our federal tax system will be improved and simplified or whether the forthcoming tax legislation in Congress will only add to the complexities, inequities and burdens of present tax laws."

Continuing Mr. Heimann said that, "The outcome of the situation may depend largely on the extent to which business men devote attention to this vitally important matter and express themselves about their tax problems to their Representatives and Senators in Congress. The federal government needs additional revenue for the defense program and that will be the basic purpose of any tax legislation sponsored by the Administration. While it is likely that business will bear the brunt of the added tax load, it is interesting to note a growing realization in Washington as to the importance of rationalization of the tax system, and an apparent desire to find some way to handle the tax problem without adding unduly to the burdens of business. Congressional hearings on proposed tax bills will give business organizations and business men an opportunity to request changes in our tax laws. In approaching this matter two important facts should be kept in mind. First, the government needs more tax revenue and an increase in the present tax load will have to be faced; secondly, all recommended tax changes submitted to Congress should be supported by convincing evidence of the need for the change."

In asserting that the United States is not headed toward inflation, Mr. Heimann said in part: "Although inflation possibilities grow as the United States' debt rapidly proceeds toward higher levels, post-world war experience of some European countries is hardly likely in any forseeable future in this country. Nevertheless, the manner of our deficit financing for the defense program will have a considerable influence on our financial record after the conflict. If most of the government securities are absorbed by individuals and corporations, rather than by the banks which have been the main source of the government's funds in the past decade, then credit inflationary tendencies can be reasonably well controlled. It behooves every American citizen to do his part to help direct this financing along sound lines

and to share in the new bond program. In considering this whole problem, we do not overlook the recent anti-inflationary recommendations of the Federal Reserve Board. They constitute a sound plan and should be urged upon our Congressmen and Senators, not only in our own selfish interests but as a constructively patriotic service to the country."

In commenting on that aspect bearing on investments, Mr. Heimann declared that, "The feeling that the Board's program may not gain Congressional adoption is one of the factors causing uneasiness to those with an interest, large or small, in investments. It manifests itself in a renewed interest in acquisition of farm lands. Farming, however, does not provide a life of ease, either for the investor or the operator. To buy a farm merely to own a farm usually results in an accumulation of tax bills. Farming is a business, highly specialized, requiring great skill and constant attention. Profitable farming requires much ingenuity and as discerning judgment as profitable business. The farm situation has changed somewhat in this century. A generation ago, the social changes caused by the heavy immigration from abroad and the great expansion in our population automatically carried the price of real estate with it and farm land showed a steady increase in value. That is a bygone era. Today we have highly-restricted immigration and a well defined trend toward a stable population. The value of farm land is now gauged increasingly upon the return it yields."

As the House Ways and Means Committee begins consideration of new revenue legislation, talk of an 8% basic income tax rate was heard. Another proposal was said to involve raising the basic tax rate to 6% and increasing surtaxes sharply. Senator Clark, Democrat of Idaho, suggested that the tax rate should be even higher than 8% and that a sales tax might well be levied. Another comment heard in Washington was that the new tax bill might eliminate the 10% credit now allowed for "earned income". That would apparently mean that the salary of an individual would be taxed on all his income other than that exempted because of dependents.

Tools of the Chemist

A story and history of the origin and development of the apparatus and equipment used by chemists has been published by the Reinhold Publishing Corporation. The 220-page book, entitled "The Tools of the Chemist" was written by Ernest Child, contains many illustrations and describes the early development of American chemistry.

The ancestry and development of American chemical laboratory equipment and apparatus—including balances, filter paper, heating apparatus—is given in an interesting style.

Copies may be obtained from the Book Department, Technical Association of the Pulp and Paper Industry, 122 East 42nd St., New York, N. Y. Price $3.50.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks, 1941		Corresponding Weeks, 1940	
March 8	90.6	March 9	81.8
March 15	89.9	March 16	82.4
March 22	91.8	March 23	82.8
March 29	94.0	March 30	82.3
April 5	92.9	April 6	79.4
April 12 (Prelim.)	*94.9*	April 13	81.8

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1940	89.1	84.7	82.3	84.3	90.0	92.1	85.3
1941	85.1	89.4	*92.0*	...	...	...	...

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1940	85.1	81.5	85.5	84.9	80.9	85.6
1941	...	...	...	...	...	...

COMPARATIVE YEARLY SUMMARIES

	1935	1936	1937	1938	1939	1940	1941
Year to Date...	67.9	76.8	89.6	67.3	79.9	85.0	*89.3*
Year Average..	70.0	80.4	79.8	71.5	83.4	85.6	...

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS †

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1936	62	67	67	70	69	70	69	75	78	82	80	74	72
1937	80	86	86	88	85	77	66	74	69	65	55	45	73
1938	54	60	61	57	58	56	57	66	66	70	65	59	61
1939	60	67	71	69	64	67	63	72	74	84	81	71	70
1940	71	70	69	70	76	79	72	74	72	79	77	71	73
1941	75	81	*82*	..	..	..	..	..	..	..	..	..	..

Week ending Mar. 8, 1941—80
Week ending Mar. 15, 1941—82
Week ending Mar. 22, 1941—82
Week ending Mar. 29, 1941—84
Week ending Apr. 5, 1941—83
Week ending Apr. 12, 1941—*85*

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

Buy Paper Under Walsh-Healey Act

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., April 23, 1941—During the week ended April 5, the government purchased $342,072.11 worth of paper and allied products under the Walsh-Healey Act as follows: $18,144.61 worth of paper for QMC, War department, in California from Zellerbach Paper Company; $53,411.45 worth of writing and wrapping paper for S & A, navy department from Paper Corporation of U. S.; $186,840.00 worth of toilet paper for S & A, navy department from Paper Corporation of U. S.; $19,701.90 worth of target paper for Illinois War Ordnance department, from Mathers-Lamm Paper Company; $63,974.15 worth of bond and manifold paper for S & A navy department from Old Dominion Paper Company.

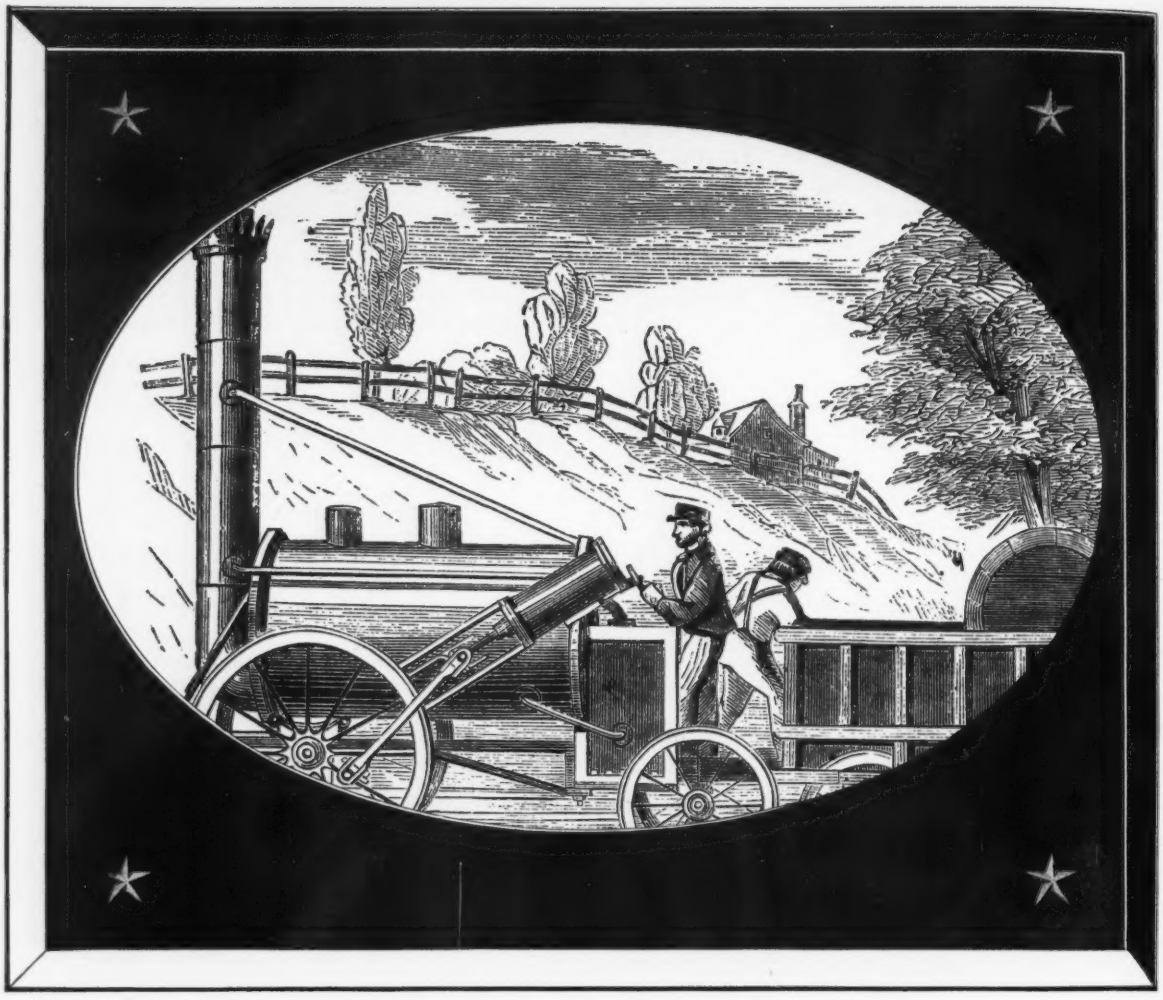
Among the $1 a Year Men

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., April 23, 1941 — Listed among the $1 a year men of the OPM Production Division from the paper industry are D. C. Everest, president of the Marathon Paper Mills Company and Charles W. Boyce, the former as consultant for paper and pulp and the latter as assistant consultant.

In the Labor Division of OPM are listed as $1 a year men George C. Arthur of the Champion Paper and Fibre Company as district representative and Alexander R. Heron of the Crown Zellerbach Corporation, also as district representative.

In the OPM Purchase Division Walter Shorter, sales manager of the International Paper Company is listed as a $1 a year man being an assistant in the industrial materials branch.



They Started Something!

THE MEN WHO built the first commercially practical locomotives brought about striking changes in the history of commerce and industry—and in the daily lives of everyone. Though the energy of steam had long been known, and employed in many ways, its utilization in the locomotive ushered in a new era in transportation. Arduous journeys that once consumed days or weeks became a matter of hours. The enjoyment of travel was placed within the reach of millions, and the transportation of goods became simple and inexpensive. The development of every industry was stimulated by the greater ease in securing raw materials, and in distributing its finished products. And the railroad industry itself became a leading consumer of industry's products.

So too when the engineers of EBG first made Liquid Chlorine commercially available in America, they gave new utility to a long-known but little-used element, and their work was destined to have far-reaching effects. EBG Liquid Chlorine gave municipalities a new and effective means for controlling the spread of water-borne diseases through purification of water supplies, and is still further increasing its usefulness today in the field of sewage sterilization. The paper and textile industries were enabled to set new standards of efficiency and economy through the use of EBG Liquid Chlorine as a bleaching agent.

The first cylinder of Liquid Chlorine made by EBG in 1909.

The *extra* experience of EBG engineers—pioneers in the production of Liquid Chlorine—works to your advantage. Specify EBG Liquid Chlorine when you buy.

ELECTRO BLEACHING GAS COMPANY
Main Office: 60 East 42nd Street, New York, N.Y.
Plant: Niagara Falls, N.Y.

EBG Liquid Chlorine
FIRST IN THE COUNTRY

Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

United States Patents on Papermaking

First Quarter, 1941

Compiled by Clarence J. West, Chairman, Committee on Abstracts and Bibliography, TAPPI

The following list of patents has been compiled from the current numbers of the Official Gazette of the United States Patent Office. Since, as a rule, only one claim is published in the Gazette, it is not claimed that the list is complete; it is also possible that some patents have been included which do not apply to papermaking.

Copies of any of the following patents may be obtained from the U. S. Patent Office, Washington, D. C., by sending ten cents for each patent desired. The number, name of inventor and title of patent should be given. Personal checks and postage stamps are not accepted. Books of coupons may be purchased for $2.00 or $10.00, good for 20 or 100 patents, respectively. Coupons do not have to be accompanied by letters of transmittal.

January 7, 1941

2,227,439. Method and apparatus for assembling boxes. Herman A. Carruth, assignor to National Folding Box Company, New Haven, Conn. Filed July 15, 1939. 17 claims. (Cl. 93-49). Method of making paperboard boxes from severably connected paired blank sections.

2,227,444. Adhesive sheet and method of making the same. Richard Gurley Drew, assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn. Filed June 29, 1935. 9 claims. (Cl. 91-68). A backing material for the purposes described comprising a relatively porous cellulose sheet impregnated with a glue unifying the fibers.

2,227,494. Method and apparatus for coating paper. Leon J. Gold, assignor to Plastics Finishing Corporation, Brooklyn, N. Y. Filed July 24, 1937. 10 claims. (Cl. 91-55). A method of applying liquid cellulose lacquer to a sheet, covering with cellulose acetate foil, drying the coating while in contact with the acetate foil, finally separating the coated paper from the foil.

2,227,497. Heat sealing device. Harold E. Hallman, Catonsville, Md. Filed Sept. 1, 1938. 9 claims. (Cl. 93-8). An apparatus for sealing wax coated papers carrying adhesives; the wax is melted and the adhesive strikes through to the paper.

2,227,516. Wax paper sheet and coating therefore. Randolph Spencer Soanes, assignor to Appleford Paper Products, Ltd., Hamilton, Ontario, Canada. Filed July 11, 1938. 2 claims. (Cl. 91-68). A paper sheet with a flexible opaque moisture-resistant heat-sealable surface containing one part of rubber to 3-7 parts of titanium dioxide, the sum total of titanium dioxide and rubber not exceeding 20 per cent of the paraffin wax.

2,227,637. Impregnating and insulating material. Rudolf Englehardt, assignor to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany. Filed May 24, 1939. 3 claims. (Cl. 260-42). A resin-like chlorinated diphenyl with about 62 per cent chlorine and about 7.5 per cent of polyvinylcarbazole.

2,227,669. Woven wire for use in papermakers' machines or apparatus. Henry Hilton Parrett, assignor to C. H. Johnson and Sons Limited, Manchester, England. Filed May 29, 1940. 5 claims. (Cl. 139-425). The warp wires are of a copper-nickel alloy (63 per cent copper) and the weft wires are of phosphor bronze.

2,227,962. Paper cutting machine. Haywood G. Dewey and Edward P. Flynn, assignors to Eastman Kodak Company, Rochester, N. Y. Filed Aug. 31, 1939. 25 claims. (Cl. 192-131).

2,227,988. Coating apparatus. Henry E. Van Derhoef, assignor to Eastman Kodak Company, Rochester, N. Y. Filed April 13, 1939. 4 claims. (Cl. 91-51). An apparatus for coating films or sheets.

2,228,122. Method for testing sealed containers. Roy E. Lowey, assignor to Container Corporation of America, Chicago, Ill. Filed Aug. 28, 1939. 1 claim. (Cl. 73-51). A method of introducing a small quantity of solid carbon dioxide, sealing the carton and placing the container in a liquid above the vaporization point of the carbon dioxide which produces a pressure condition that would cause escape of the gas through any aperture in the container.

2,228,127. Bleaching hardwood pulp. George A. Richter, assignor to Brown Company, Berline, N. H. Filed April 18, 1938. 6 claims. (Cl. 8-105). The pulp is subjected to sequential treatments with hypochlorite liquor, chlorine, alkaline refining liquor, chlorine and hypochlorite liquor, the first treatment employing sufficient hypochlorite to effect reaction with most, if not practically all, of the lignin content of the pulp.

2,228,151. Casein and its manufacture. Elmer B. Oberg, assignor to United States Gypsum Company, Chicago, Ill. Filed April 29, 1937. 6 claims. (Cl. 260-120). Skimmed milk is atomized in a substantially closed reaction zone of relatively large column, hydrochloric acid gas is mixed with the milk mist to precipitate the casein and the casein is separated from the whey.

2,228,158. Casein vehicle and method of making same. Robert R. Teale, assignor to National Gypsum Company, Buffalo, N. Y. Filed Aug. 28, 1937. 15 claims. (Cl. 134-12). Casein is dispersed at a temperature above 40 deg. C. with water and a water-soluble thiosulphate, the thiosulphate being less than about 10 per cent of the casein.

January 14, 1941

2,228,320. Method of making filter paper. Willett C. Magruder, Jr. and Alfred C. Korte, assignors to Carter Carburetor Corporation, St. Louis, Mo. Filed Oct. 8, 1937. 4 claims. (Sl. 210-204). The method of conditioning a sheet of porous paper stock for use as filter paper which comprises loosening and distorting the fibers to increase the filtering capacity of the stock and applying a thin solution of glyptal lacquer to simultaneously waterproof fibers and cause them to adhere to each other.

2,228,332. Coating objects with artificial materials. George Wick and Arnd Iloff, assignors to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany. Filed March 22, 1938. 3 claims. (Cl. 154-2). A method of applying polyvinyl chloride, with application of heat up to about 100 deg. C.

2,228,349. Treatment of woody material. Soldon Feldman and Fredrich Olsen, assignors to The Cellulose Research Corporation, East Alton, Ill. Filed Nov. 28, 1936. 5 claims. (Cl. 92-13). The chips are treated with a boiling, very dilute solution of a nondelignifying electrolyte (such as aluminum sulphate or sodium chloride) until the air has been completely removed and are then cooked with a soda pulping liquor.

2,228,463. Shingle for roofing or the like. Lester Kirschbraun, assignor to The Patent and Licensing Corporation, New York, N. Y. Filed March 5, 1940. 3 claims. (Cl. 108-7). A method of coating a shingle element with asphalt to prevent passage of water by capillary action under the overlying shingle.

2,228,465. Coloring of paper with sulphur colors. Edwin R. Laughlin, assignor to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed Nov. 29, 1938. 8 claims. (Cl. 8-37). A basis solution of a reduced sulphur dye and a soluble sulphide is added to the stock in the beater, followed by the salt of a metal which forms an insoluble sulphide in basic or neutral solution until all the sulphide is precipitated.

2,228,567. Resinous composition. Hans John, assignor to Paper Patents Company, Neenah, Wis. Filed Sept. 3, 1938. 17 claims. (Cl. 260-72). Sulphite waste liquor is mixed with a primary aromatic amine and an aldehyde in the presence of a strong acid.

2,228,628. Treatment of sulphite waste liquor. Ludwig Hahn, assignor of one-half to the firm: Böhmisch-Krumauer Maschinenpapier-Fabriken Ignaz Spiro et Söhne, Aktiengesellschaft, Cesky Krumlov, Czechoslovakia. Filed Sept. 9, 1938. 4 claims. (Cl. 195-32). Sulphite waste liquor, freed from gases, is neutralized and fermented in the absence of added nutrient salts and in the presence of vegetable matter carrying fermentative cultures developed on the vegetable matter in the presence of sulphite waste liquor.

2,228,636. Method of making tubular bodies. Alessandro Magnani, assignor to F. L. Smidth & Co. A/S, Copenhagen, Denmark. Filed Aug. 24, 1937. 1 claim. (Cl. 92-54). Method of molding pulp into tubes.

2,228,647. Method of making containers. Harry F. Waters, New York, N. Y. Filed April 12, 1940. 15 claims. (Cl. 93-36.01). Method of forming a carton with an inner envelope with a single open edge.

2,228,656. Carton lining machine. Frank C. Drinkwater, assignor to Pneumatic Scale Corporation, Limited, Quincy, Mass. Filed Nov. 15, 1938. 5 claims. (Cl. 93-36.01).

2,228,784. Liquid starch and process for making the same. Simon Spilka, Philadelphia, Pa. Filed March 14, 1939. 2 claims. (Cl. 134-19). A nonseparating, nonsticking, fiber-penetrating liquid starch containing 12 ounces of starch, 0.5 ounce of sodium fluoride and 15 grams of pine oil in one gallon of water.

2,228,785. Sealed package and method of making same. Marshall H. Smith and Roy A. Nash, assignors to Marathon Paper Mills Company, Rothschild, Wis. Filed March 1, 1939. 8 claims. (Cl. 216-62). A method of using waxed wrapping material with a supplementary sheet secured thereto with a thermoplastic composition.

2,228,877. Apparatus for the production of mineral surfaced roofing. Henry Clay Howell, assignor to Barber Asphalt Corporation, Barber, N. J. Filed July 22, 1938. 4 claims. (Cl. 91-43). A method of applying heated granular material to the roofing base.

2,228,910. Method and apparatus for making reinforced tape. George Ellwood Houghton, assignor to Johns-Manville Corporation, New York, N. Y. Filed Oct. 30, 1937. 7 claims. (Cl. 154-29).

2,228,932. Machine for making open boxes. Henry B. Thompson, assignor to Peter Paul, Inc., Naugatuck, Conn. Filed June 18, 1938. 4 claims. (Cl. 93-51). A machine for folding blanks.

2,228,943. Egg carton assembling device. Samuel Bergstein, Cincinnati, Ohio. Filed June 16, 1939. 13 claims. (Cl. 93-37).

2,228,976. Molding material and method of producing the same. Herman J. Reboulet, assignor to The Mead Corporation, Chillicothe, Ohio. Filed July 11, 1936. 4 claims. (Cl. 260-124). Black liquor is treated with carbon dioxide to precipitate about 25 per cent of the total solids, which consists of lignin; this is separated, washed and treated with strong acid to neutralize the product.

JANUARY 21, 1941

2,229,028. Zein solution. Oswald C. H. Sturken, assignor to Corn Products Refining Company, New York, N. Y. Filed July 14, 1939. 4 claims. (Cl. 154-40). Paper sheets are dipped in a zein solution containing blown castor oil, dried, superposed, and subjected to heat and pressure, resulting in a laminated paper.

2,229,116. Bottle crown paraffin coating device. Berthold Nagy, Brooklyn, N. Y. Filed June 29, 1939. 9 claims. (Cl. 91-47).

2,229,121. Method and apparatus for operating on sheet material. Norman H. Nye and Ralph L. Penn, Cuyahoga Falls, and Ralph W. Penn, Akron, Ohio, assignors of one-fourth to Edwin J. McIlvried, Stow, Ohio. Filed April 27, 1938. 14 claims. (Cl. 93-19).

2,229,141. High pressure roller mill. Matthew J. Stacom, assignor to Stacom Process Corporation, Long Island City, N. Y. Filed Dec. 11, 1936. 8 claims. (Cl. 100-47).

2,229,142. Mechanical dehydrator and roller mill. Matthew J. Stacom, assignor to Stacom Process Corporation, Long Island City, N. Y. Filed Dec. 14, 1937. 13 claims. (Cl. 100-47).

2,229,143. Apparatus for expressing liquids from solid substances. Matthew J. Stacom, assignor to Stacom Process Corporation, Long Island City, N. Y. Filed Jan. 27, 1939. 21 claims. (Cl. 100-47).

2,229,155. Indicator paper. Henry Wenker, Elizabeth, N. J. Filed April 23, 1938. 6 claims. (Cl. 23-253). A carrier paper embodying a non-fixed and transitory-reading indicator is coated with wax.

2,229,255. Method of making acoustical panels. Arthur D. Park, assignor to Armstrong Cork Company, Lancaster, Pa. Filed March 30, 1938. 5 claims. (Cl. 154-28).

2,229,265. Rosin composition. Herbert John West, assignor to American Cyanamid Company, New York, N. Y. Filed Feb. 25, 1939. 9 claims. (Cl. 260-24). A composition prepared by heating rosin at 180-220 deg. C. with the material obtained upon reacting an initial aminotriazinealdehyde condensation product with an alcohol.

2,229,286. Paper feeding and cutting means. Israel C. Gellman, assignor to Gellman Manufacturing Company, Rock Island, Ill. Filed Oct. 29, 1937. 13 claims. (Cl. 93-2). A wrapping machine.

2,229,287. Bread wrapping machine. Israel C. Gellman, assignor to Gellman Manufacturing Company, Rock Island, Ill. Filed Oct. 29, 1937. 10 claims. (Cl. 93-2).

2,229,311. Cement composition. Edward W. Scripture, Jr., assignor to Dewey and Almy Chemical Company, Cambridge, Mass. Filed June 7, 1940. 10 claims. (Cl. 106-27). A mixture of cement and sulphite waste liquor, modified by precipitation of sulphate ions therefrom through addition of a soluble alkaline earth compound.

2,229,343. Composition of matter and process of making the same. Seymour G. Saunders and Harry Morrison, assignors to Chrysler Corporation, Highland Park, Mich. Filed Oct. 8, 1936. 9 claims. (Cl. 91-68). A container for food, beverages, etc., with a substantially tasteless and odorless coating comprising a reaction product of partially reacted vegetable oil distillation residue, sulphur and red lead, the reaction being initiated by ultraviolet light.

2,229,356. Coated and waterproofed product. Peter J. Gaylor, assignor to Standard Oil Development Company, Linden, N. J. Filed March 27, 1934. 5 claims. (Cl. 91-68). Paraffin and a substantially saturated linear polymer of isobutylene having a molecular weight greater than 1000.

2,229,357. Fibrous product. Gordon E. Wightman and Ernest Kritzmacher, assignors to Union Carbide and Carbon Corporation, New York, N. Y. Filed Jan. 25, 1937. 3 claims. (Cl. 92-40). Fibrous composition with a binder and in addition a hydrophile heat-hardened phenolic resinoid capable of admixture with up to 70 parts of water per 30 parts of the resinoid in neutral condition without clouding or precipitation.

2,229,396. Thick butt shingle. Benjamin Sweedler, assignor to The Patent and Licensing Corporation, New York, N. Y. Filed Aug. 2, 1938. 3 claims. (Cl. 108-7).

2,229,401. Method of making vibration and sound damping materials. Erwin A. Worm, Jr., assignor to Armstrong Cork Company, Lancaster, Pa. Filed March 20, 1940. 10 claims. (Cl. 154-28).

2,229,490. Method of spraying adhesives. Raymond C. Benner, Romie L. Melton and Henry P. Kirchner, assignors to The Carborundum Company, Niagara Falls, N. Y. Filed May 26, 1936. 3 claims. (Cl. 91-68). Method of applying a layer of glue to an abrasive coated web.

2,229,542. Bag folding mechanism. Charles F. Allison, assignor to American Bag Closing Machine Company, Chicago, Ill. Filed July 15, 1938. 22 claims. (Cl. 93-6).

2,229,616. Finishing system for porous surfaces. Herbert L. Wampner, assignor to Commercial Solvents Corporation, Terre Haute, Ind. Filed Sept. 17, 1937. 5 claims. (Cl. 91-68). A method of applying a coating material in a solvent.

2,229,620. Method of applying coating materials to paper. Donald B. Bradner, assignor to The Champion Paper and Fibre Company, Hamilton, Ohio. Filed Nov. 16, 1937. 4 claims. (Cl. 92-40). A method of making surface-filled paper which consists in applying aqueous liquid coating material to the web after the last application of suction and before drying, wiping off that part of the coating which lies above the level of the surface fibers and then drying the web.

2,229,621. Method of coating paper. Donald B. Bradner, assignor to The Champion Paper and Fibre Company, Hamilton, Ohio. Filed June 10, 1938. 11 claims. (Cl. 92-40). A coating composition is applied to a traveling web of paper which is absorptive to the liquid of the coating composition to a degree to form a layer of firm filter cake from the pigment adjacent to the web while the overlying coating composition remains fluent, wiping off the fluent coating composition without removing any of the filter cake and drying the paper.

JANUARY 28, 1941

2,229,743. Insulation and like structures. Harry C. Karcher, assignor to Lambert M. Payne, Detroit, Mich. Filed Dec. 1, 1937. 3 claims. (Cl. 154-45). A corrugated paper product.

2,229,831. Knife-coating apparatus. Floyd W. Adams, assignor to The Celotex Corporation, Chicago, Ill. Filed Sept. 28, 1938. 19 claims. (Cl. 91-13). An apparatus for knife-coating a blank of felted fibrous sheet material.

2,229,864. Method and means for making containers. George Arlington Moore, assignor to Humoco Corporation, Louisville, Ky. Filed Nov. 6, 1937. 17 claims. (Cl. 93-3).

2,229,867. Artist's working paper. Joseph F. Murphy, West Roxbury, Mass. Filed Dec. 27, 1939. 4 claims. (Cl. 41-17). A paper is provided with reticulated lines sufficiently closely spaced to give a half-tone effect on said surface.

2,229,882. Process for the production of coating preparations. Josef Binapfl, Eugen Bock, Friedrich Frick and Otto Jordan, assignors to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany. Filed June 24, 1937. 6 claims. (Cl. 260-736). Chlorinated rubber, its hydrochloride or ruber hydrochloride is mixed with water and a solvent which is immiscible with water in the presence of an emulsifying agent.

2,229,886. Method of digesting fibrous materials. Thomas L. Dunbar, assignor to Chemipulp Process, Inc., Watertown, N. Y. Filed Dec. 19, 1934. 10 claims. (Cl. 92-7). The hot liquor is pumped continuously and directly to and from the digester during the soaking operation for simultaneously withdrawing gases from the digester and returning such gases in admixture with liquor to the digester.

2,229,916. Paper creping machine. Peter J. Christman, Green Bay, Wis. Filed Nov. 3, 1938. 3 claims. (Cl. 154-30).

2,229,921. Method of and apparatus for coating sheet material. Lindsay O. Goff and Frederick H. Frost, assignors to S. D. Warren Company, Boston, Mass. Filed April 23, 1938. 8 claims. (Cl. 91-33). The smoothing and leveling means consists essentially of a convexly curved confining surface the long axis of which is substantially transverse to and parallel with the plane of the sheet, the confining surface being coextensive in width with the width of the sheet and forming with the latter a throat which is elongated in the direction of travel of the sheet, with means to direct a stream of air under pressure longitudinally into the throat.

2,229,923. Decoration of textiles and other tissues. Eric Berkeley Higgins, Punchetts, Tewin Wood, England. Filed May 24, 1938. 13 claims. (Cl. 8-17). A very dilute solution of an amphoteric protein reacts in the cold with a solution of an amphoteric material under acid conditions and in the presence of a coloring material to develop an insoluble colored complex within the fiber.

2,230,119. Process of producing wood cellulose. Fredrich Olsen, Lionel Goff, and Lyle Melvin Sheldon, assignors to The Cellulose Research Corporation, East Alton, Ill. Filed Feb. 18, 1937. 4 claims. (Cl. 92-11). Sulphite pulp is treated with chlorine in an amount which will exhaust in from 10 to 30 minutes, the chlorinated pulp is subjected to dilute alkali at an elevated temperature to dissolve the chlorinated compounds and reduce bleach values and then treated with hypochlorite; before exhaustion of the bleach the pulp is treated with dilute caustic soda.

FEBRUARY 4, 1941

R21,706. Method of making paper boxes or the like with printed wrappers. Clarence Lloyd Claff, assignor to Norfolk Paper Company, Inc., Randolph, Mass. Original No. 2,166,287, dated July 18, 1939. Application for reissue June 7, 1940. 13 claims. (Cl. 93-36.6).

2,230,321. Pulp screen. Henry William Downs, Lennoxville, Quebec, Canada. Filed Feb. 23, 1939. 1 claim. (Cl. 92-30).

2,230,507. Apparatus for applying adhesive strips on a continuous web. Heinrich Wolff, assignor to Pirie, Appleton & Co., Ltd., London, England. Filed July 8, 1937. 3 claims. (Cl. 91-55). Apparatus for preparing a web for the manufacture of dry sealing envelopes and bags.

2,230,592. Process of preparing magnesia and sulphur dioxide. Robert Griessbach, Walther Sütterlin and Hans Zirngibl, assignors to Walther H. Duisberg, New York, N. Y. Filed Sept. 15, 1939. 2 claims. (Cl. 23-177). Process of preparing magnesia and sulphur dioxide by reduction of magnesium sulphate at temperatures up to 1,000 deg. C., using coal and gas as reducing agents.

2,230,647. Pulp screening machine. Nelson M. Knight, Boston, Mass. Filed July 9, 1938. 4 claims. (Cl. 92-29).

2,230,748. Impregnating solution for textiles or other organic materials. Bror Olof Häger, assignor to Bolideno Gruvaktiebolag, Stockholm, Sweden. Filed March 14, 1938. 6 claims. (Cl. 134-78.6). A liter of aqueous solution contains 10 grams of arsenious acid, 15 grams of an alkali metal bichromate and 20 grams of a mild reducing agent.

2,230,876. Coating process and product. M. Earl Wysong, assignor to The Fred Goat Company, Inc., Brooklyn, N. Y. Filed July 14, 1937. 6 claims. (Cl. 91-67.9). A web having a printed or inked surface is coated with vinyl acetate resin and a second coating of cellulose acetate.

2,230,934. Waterproof sandpaper. Richard Paul Carlton and Byron J. Oakes, assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn. Filed Nov. 7, 1940. 10 claims. (Cl. 51-298). The abrasive particles are bonded to the backing by a phenol-fatty-oil-reactive-resin and an oil compound having added thereto a glyptal type of resin for increasing and retaining the flexibility thereof.

2,230,963. Adhesive applying mechanism. Kenneth W. Macdonald, assignor to Oskar W. Wikstrom, Newton, Mass. Filed April 1, 1938. 13 claims. (Cl. 91-51). A gluing mechanism for paper blank handling apparatus.

FEBRUARY 11, 1941

2,230,998. Multiple wall paper bag. Lige Coakley and Harold V. Kindseth, assignors to Bemis Bro. Bag Company, Minneapolis, Minn. Filed Nov. 16, 1938. 8 claims. (Cl. 229-55). A method of producing a moistureproof bag.

2,231,032. Method of making containers. John W. Simmons, Cleveland Heights, Ohio. Filed Feb. 23, 1939. 7 claims. (Cl. 113-120). Method of making a box of the hopper front type.

2,231,050. Method of preparing an adhesive. George M. Bierly, Columbus, Ohio. Filed April 26, 1939. 3 claims. (Cl. 134-23.4). The water-soluble sizing contains 100 parts of starch, 25 parts of lactic acid and 1 part of sodium chlorate, which are heated at 110 deg. C. until the starch is converted into a compound soluble in hot water.

2,231,051. Method and apparatus for applying patches to bags. Louis Bischoff, assignor to Oneida Paper Products, Inc., New York, N. Y. Filed June 22, 1937. 8 claims. (Cl. 93-8).

2,231,171. Method of and apparatus for embossing. Leonard E. Randecker, assignor to Hammermill Paper Company, Erie, Pa. Filed Sept. 22, 1938. 12 claims. (Cl. 101-23). A means for providing a zone of controlled tension in the sheet in the zone of the nip of the embossing rolls.

2,231,224. Paper-making machine. David Russell and James Robert Happer, Markinch, Fife, Scotland. Filed Dec. 31, 1938. 2 claims. (Cl. 92-53). A suction roll for spreading and drying a papermaking felt.

2,231,421. Colloid mill. Louis Gitzendanner, assignor to Greenwich Machine and Tool Company, Inc., New York, N. Y. Filed Jan. 22, 1938. 15 claims. (Cl. 83-13).

2,231,426. Method of bleaching gray goods. Hans O. Kauffmann, assignor to Buffalo Electro-Chemical Company, Inc., Buffalo, N. Y. Filed May 10, 1939. 9 claims. (Cl. 8-111). The goods are treated with alkaline peroxide liquor, first with a low liquor ratio and then with a high liquor ratio.

2,231,467. High surface hiding pigment material and process of making the same. Marion L. Hanahan, assignor to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed Dec. 8, 1938. 17 claims. (Cl. 134-58). A method of coating a white pigment with a gel-like polymeric carbohydrate compound.

2,231,468. High surface hiding pigment material and process of making the same. Marion L. Hanahan, assignor to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed Dec. 8, 1938. 17 claims. (Cl. 134-58). Method of forming on the surface of an extended material a coating of a gel-like polymeric carbohydrate compound.

2,231,486. Waterproofing composition. Ar-

ther F. Taggart, Scarsdale, N. Y. Filed March 19, 1938. 11 claims. (Cl. 134-15). A mineral wax, a water-repellent thickener and a common solvent, mixed in such proportions that upon concentration the thickener and solvent will thicken before the wax or other hydrophobic material begins to precipitate.

2,231,562. Manufacture of alkali-resistant laminated articles. John D. Carter, assignor to Philadelphia Quartz Company, Philadelphia, Pa. Filed Dec. 21, 1937. 20 claims. (Cl. 154-40). At least one of the plies is impregnated with an ammonium compound which will neutralize at least a substantial proportion of the alkali derived from the adhesive and thus prevent penetration of the alkali in the plies.

2,231,574. Means for making windowed carton blanks coated on both sides. John L. Emerick, Glenshaw, Pa. Filed Feb. 21, 1938. 1 claim. (Cl. 91-50). A device for applying coating to a carton blank formed with a window opening.

February 18, 1941

2,231,901. Process of hydrating calcined gypsum. Joseph W. Gill, assignor to United States Gypsum Company, Chicago, Ill. Filed Oct. 24, 1936. 1 claim. (Cl. 134-58). One part of calcined gypsum is agitated with 1.5 to 2 parts of a dilute aqueous solution of an alkali metal phthalate.

2,231,902. Paper coating material and the paper coated therewith. James S. Offutt and Joseph W. Gill, assignors to United States Gypsum Company, Chicago, Ill. Filed March 2, 1939. 10 claims. (Cl. 134-20). A paper-coating mixture comprises casein, a casein solvent, formaldehyde, clay, "gamma gypsum," and water.

2,231,928. Method of treating cellulosic material. Christopher Luckhaupt, Jamaica, N. Y. Filed March 28, 1938. 3 claims. (Cl. 18-55). The material (sulphite, soda or kraft pulp) is heated with terpin hydrate at about 115 deg. C. and then subjected to heat and pressure in a suitable mold.

2,231,953. Process for the treatment of organic fibrous materials. Charles Ruzicka, assignor to Celec Corporation Limited, London, England. Filed July 9, 1938. 2 claims. (Cl. 92-17). Fibers, such as esparto grass, jute, hemp, linseed straw, coconut fiber, bamboo, soya bean stalks, etc., are treated for 9 hours with 3 per cent caustic potash at 90-5 deg. C., washed with water, treated 16-18 hours with a saturated solution of sulphurous acid at 80-90 deg. C., washed again and bleached with 5 per cent sodium hypochlorite for 48 hours.

2,231,965. Method of carbonating lime and separating the same from magnesia. Horace E. Stump, Falls Village, Conn. (Bertha B. Stump, executrix). Filed June 22, 1937. 14 claims. (Cl. 23-201). Method of separating calcium from magnesium in an aqueous suspension of their hydroxides by treatment with carbon dioxide so that the calcium hydroxide is transformed into the carbonate.

2,232,041. Electrical insulating material. John Krauss Webb, assignor to International Standard Electric Corporation, New York, N. Y. Filed Jan. 7, 1939. 9 claims. (Cl. 154-2.6). Fibrous material is impregnated with monomeric styrene and polymerized in a closed vessel in the presence of styrene vapor at 90-100 deg. C., producing a fine granular surface film of polystyrene.

2,232,069. Coating machine. Clifford E. Ives, assignor to Sears, Roebuck & Co., Chicago, Ill. Filed Nov. 5, 1937. 17 claims. (Cl. 91-50).

2,232,162. Process of producing an alkali-metal silicate-clay adhesive. Ernest R. Boller, assignor to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed May 26, 1939. 6 claims. (Cl. 134-23.92). A suspension of china clay in water is added to a silicate solution.

2,232,186. Method of and apparatus for packaging material. Thomas E. Piazze and Roy E. Hanson, assignors to Milprint, Inc., Milwaukee, Wis. Filed April 24, 1939. 19 claims. (Cl. 93-3).

2,232,239. Apparatus for securing bag bottoms. Edward Jaeger, assignor to Oneida Paper Products, Inc., New York, N. Y. Filed April 12, 1938. 14 claims. (Cl. 93-8).

2,232,365. Corrugating machine guide mechanism. Hobart W. Bruker, assignor to George W. Swift, Jr. Inc., Bordentown, N. J. Filed Nov. 30, 1940. 8 claims. (Cl. 154-30).

2,232,558. Paper cutter for wrapping machines. Charles H. Petskeyes and Israel C. Gellman, assignors to Gellman Manufacturing Company, Rock Island, Ill. Filed Feb. 27, 1939. 17 claims. (Cl. 93-2).

2,232,595. Coating and film forming compositions. Harry Robert Dittmar and Reginald Grice Kennelly, assignors to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed May 20, 1938. 6 claims. (Cl. 260-28). A mineral wax (at least 60 parts) and at least 15 parts of a polymeric alkyl methacrylate, the alkyl group of which contains more than two carbon atoms.

2,232,640. Method of making articles from heat fusible sheet material. Daniel B. Schwartzman, assignor to Protex Products Company, Jersey City, N. J. Filed Dec. 23, 1938. 3 claims. (Cl. 93-35). Sheets of hydrochlorinated rubber and paper in a stack are cut with a heated die, whereby the edges of the contacting sheets will become fused and attached together.

February 25, 1941

2,232,834. Process of calcining lime sludge. Nikolai Ahlmann, assignor to F. L. Smidth & Company, New York, N. Y. Filed Nov. 24, 1939. 1 claim. (Cl. 263-53). Previously dried or partly calcined sludge is mixed with raw sludge and formed into a layer through which gases at a temperature sufficiently high to calcine the sludge is passed for a time sufficient to calcine one part of the layer and dry the remainder, the two layers separated and the partly calcined portion is mixed with the raw sludge with repetition of the operation.

2,232,932. Box-making machine. Clayton Straw and Charles H. George, assignors to Kingsbury & Davis Machine Company, Contoocook, N. H. Filed June 13, 1940. 8 claims. (Cl. 93-51).

2,232,977. Method of producing integral waterproofing emulsions and products thereof. Charles H. Schuh, assignor to Bakelite Building Products Co., Inc., New York, N. Y. Filed April 9, 1938. 16 claims. (Cl. 134-15). A waterproofing composition comprises an emulsion of a thermoplastic water-repellent substance having in the continuous phase an aqueous body of soluble soap of less than 12.5 per cent concentration; for every 10 parts by weight of water-repellent substance there is at least 8 parts by weight of combined water and soap.

2,232,989. Printing apparatus. Charles E. Wooddell, assignor to The Carborundum Company, Niagara Falls, N. Y. Filed May 19, 1936. 8 claims. (Cl. 154-54.5). A sheet support consists of paper adhesively coated with a tough resilient film of plastic material (synthetic resin).

2,232,990. Preparation of oxycellulose. Edward C. Yackel and William O. Kenyon, assignors to Eastman Kodak Company, Rochester, N. Y. Filed July 15, 1938. 5 claims. (Cl. 260-212). One part of cellulose, under non-nitrating conditions, is treated with 0.6 part of gaseous nitrogen dioxide at about 20 deg. C. until the cellulose is substantially alkali soluble.

2,233,068. Apparatus for wrapping cylindrical articles. Donald George Ashcroft, assignor to Imperial Chemical Industries Limited, London, England. Filed June 7, 1939. 3 claims. (Cl. 93-2).

2,233,090. Adhesive-coated sheet material. Benjamin Asnes and Ernest L. Kallander, assignors to Dennison Manufacturing Company, Framingham, Mass. Filed Jan. 24, 1939. 5 claims. (Cl. 260-757). A thermoplastic coating comprises 22-130 parts of wax, 30-80 parts of rubber, 6-15 parts of vinyl resin and not more than 2 parts of chlorinated rubber.

2,233,122. Method and apparatus for manufacturing roofing materials. Frank B. Burns, assignor to United States Gypsum Company, Chicago, Ill. Filed Feb. 28, 1938. 12 claims. (Cl. 91-14). A method of applying granules of different sizes to a foundation element carrying a plastic coating.

2,233,141. Antioxidant for packaging materials. Sidney Musher, assignor to Musher Foundation Incorporated, New York, N. Y. Filed Feb. 16, 1938. 12 claims. (Cl. 91-68). The wrapping material is treated with an antioxidant and then coated with a water-repellent nonantioxygenic coating.

2,233,142. Paper packaging material and method of making the same. Sidney Musher, assignor to Musher Foundation Incorporated, New York, N. Y. Filed May 29, 1939. 9 claims. (Cl. 91-68). A wrapper which has been treated with an antioxygenic compound selected from the group consisting of hydroquinone, guaiacol, resorcinol, pyrogallol, tyrosine, eugenol, thymol, vanillin, gallic acid and gallotannin and which contains an overcoat of a wax.

2,233,143. Packaging material. Sidney Musher, assignor to Musher Foundation Incorporated, New York, N. Y. Filed May 24, 1937. 6 claims. (Cl. 91-68). The packaging material is interiorly surfaced with an antioxygenic water-soluble extract of oil-containing seeds and cereals and coated with a paraffin waterproofing composition.

2,233,170. Coated paper. Clarence M. Loane, assignor to Standard Oil Company, Chicago, Ill. Filed Dec. 16, 1936. 8 claims. (Cl. 91-68). The paper surface is impregnated with a small amount of tertiary butylcatechol and then coated with a hydrocarbon coating material (paraffin wax, petrolatum or refined hydrocarbon oils).

2,233,171. Coated paper. Clarence M. Loane, assignor to Standard Oil Company, Chicago, Ill. Filed Sept. 25, 1940. 6 claims. (Cl. 91-68). The material is given a surfacing of an antioxidant (an aromatic amine) and then treated with a nonantioxygenic water-repellent coating.

2,233,172. Coated paper. Clarence M. Loane, assignor to Standard Oil Company, Chicago, Ill. Filed Sept. 25, 1940. 4 claims. (Cl. 91-68). The material is given a surfacing of an antioxidant (monohydric phenols and naphthols) and then treated with a nonantioxygenic water-repellent coating.

2,233,175. Manufacture of abrasive coated articles. Romie L. Melton and Raymond C. Benner, assignors to The Carborundum Company, Niagara Falls, N. Y. Filed March 28, 1940. 11 claims. (Cl. 51-298). Abrasive granules on a web with a heat-maturable adhesive are treated with a high-frequency current so that they are heated sufficiently to mature the adhesive.

2,233,176. Manufacture of bonded abrasive articles. Romie L. Melton and George L. Chapman, assignors to The Carborundum Company, Niagara Falls, N. Y. Filed March 28, 1940. 17 claims. (Cl. 51-298). High-frequency alternating currents are used to heat the granules and mature the binding agent.

2,233,186. Wax paper sheet and coating therefor. Randolph Spencer Soanes, assignor to Appleford Paper Products, Ltd., Hamilton, Ontario, Canada. Filed July 11, 1938. 1 claim. (Cl. 91-68). The paper is coated with 80 parts ester gum, 20 parts paraffin wax and 2-3 parts rubber.

2,233,190. Insulating board. Raoul Amorosi, Chicago, Ill. Filed Nov. 7, 1938. 7 claims. (Cl. 20-4).

2,233,298. Method for treating paper insulation material in the manufacture of paper insulated electric cables. Cornelius Fredrik Proos, The Hague, Netherlands. Filed July 2, 1938. 4 claims. (Cl. 34-24). A roll of paper is heated and unwound while in the heated condition in unsaturated air, which frees the paper from moisture.

March 4, 1941

2,233,423. Method of making fiber containers. Donald G. Magill, assignor to American Can Company, New York, N. Y. Filed Jan. 19, 1939. 5 claims. (Cl. 93-94). A method of applying a molten wax coating on a strip of paper to a paper tube and suddenly cooling the molten coating so as to change its crystalline structure and increase its resistance to moisture.

2,233,484. Manufacture of composite structures. John F. Pagendarm, Oakland, Calif., assignor to Bemiss Corporation. Filed May 15, 1939. 10 claims. (Cl. 154-1). Machine for making wire-reinforced corrugated sheet.

2,233,619. Thickening apparatus. Harry A. Linch, assignor to The Dorr Company, Inc., New York, N. Y. Filed Jan. 10, 1939. 15 claims. (Cl. 210-55). Apparatus for settling solids from a liquid-solids suspension.

2,233,641. Pulp treatment. Elmer R. Ramsey, assignor to The Dorr Company, Inc., New York, N. Y. Filed Feb. 9, 1937. 8 claims. (Cl. 210-55). Saveall or apparatus for settling solids from a liquid-solids suspension.

2,233,755. Slitting and winding machine. William M. Stocker, assignor to Cameron Machine Company, Brooklyn, N. Y. Filed June 25, 1940. 3 claims. (Cl. 164-65).

2,233,816. Shelf paper. Robert J. Hutt and George A. Hutt, Brooklyn, N. Y. Filed Dec. 1, 1939. 2 claims. (Cl. 41-10). An edging strip is applied to the outer face of the drop strip.

2,233,841. Process for recovery of sulphur dioxide from gases. Robert Lepsoe, assignor to The Consolidated Mining & Smelting Company of Canada, Limited, Montreal, Quebec, Canada. Filed Oct. 28, 1938. 6 claims. (Cl. 23-178). The sulphur dioxide is absorbed in an ammonium bisulphite-ammonium monosulphite solution, the cycling solution in the absorption stage being maintained nearly saturated with respect to amonium sulphate and unsaturated with respect to the other salts present; the sulphur dioxide is regenerated by heat.

2,233,854. Means for smoothing the edges of coated boards. Gilbert J. Snyder, assignor to Mastic Asphalt Corporation, South Bend, Ind. Filed May 1, 1939. 10 claims. (Cl. 91-18).

2,233,875. Laminated board and method of making same. John H. Schmidt and Ralph T. Casselman, assignors to Union Carbide and Carbon Corporation, New York, N. Y. Filed Jan. 13, 1937. 17 claims. (Cl. 154-2). The laminating agent is a synthetic phenolic aldehyde resin and an acidic hardener.

2,233,965. Method of delivering and diluting aqueous dispersions of wax, rosin and the like. Florian Strovink, assignor to Bennett Incorporated, Cambridge, Mass. Filed May 14, 1937. 3 claims. (Cl. 137-165).

2,234,051. Manufacture of bags. Eino E. Lakso, assignor to Owens-Illinois Glass Company, Toledo, Ohio. Filed April 13, 1940. 14 claims. (Cl. 93-18).

2,234,057. Causticizing tower. Morris B. Mount, Lynchburg, Va. Filed Jan. 11, 1939. 3 claims. (Cl. 23-283).

2,234,108. Paper dish and method of making the same. Herman Carew, assignor to Dixie-Vortex Company, Easton, Pa. Filed

Nov. 21, 1938. 8 claims. (Cl. 93-51). Method of forming a container from a single piece of material.

2,234,116. Apparatus for stacking sheets. William F. Grupe, assignor to Champlain Corporation, New York, N. Y. Filed March 12, 1938. 17 claims. (Cl. 271-76).

2,234,126. Lignocellulose fiber products. William H. Mason, assignor to Masonite Corporation, Laurel, Miss. Filed June 4, 1938. 4 claims. (Cl. 92-39). A hot-consolidated grainless hard board of felted raw lignocellulose containing the natural encrusting substances which can be activated to serve as binding agents upon a sheet of the fiber in initially bone-dry state on being heated under compression at about 400 deg. F.

March 11, 1941

2,234,175. Packaging machine. John Jackson and August J. Schmidt, assignors to American Machine & Foundry Company, New York, N. Y. Filed March 25, 1937. 10 claims. (Cl. 93-7).

2,234,188. Process of making light-colored ligno-cellulose fiber. Howard W. Morgan and Basil O. Stewart, assignors to Masonite Corporation, Laurel, Miss. Filed March 31, 1938. 11 claims. (Cl. 92-1). Process of making steam-exploded fiber which is light colored and which consists in impregnating the raw material with 5-15 per cent of an alkali sulphite and subjecting the impregnated material to a steam pressure of over 300 pounds per square inch.

2,234,363. Process of impregnating fibrous material and the material thus obtained. Arnold Brunner and Georg von Finck, assignors to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany. Filed Jan. 8, 1938. 12 claims. (Cl. 91-70). Organic nitrogen compounds are used; they are produced by reacting a phenol of the general formula RCH_2Cl with a nitrogen base.

2,234,446. Composition shingle and roof formed therewith. Theophilus Gregory Murphy, Los Angeles, Cal. Filed July 29, 1940. 12 claims. (Cl. 108-7).

2,234,457. Paperboard manufacture. Florian A. Strovink, assignor to Bennett Incorporated, Cambridge, Mass. Filed March 31, 1939. 10 claims. (Cl. 92-39). In a paperboard designed to cleave apart most readily on predetermined internal planes, the internal ply contains a water-repellent cellulose-softening agent (0.25 to 5 per cent) selected from a class consisting of oil and wax.

2,234,501. Process of impregnating fibrous materials and the material thus obtained. Joseph Nüsslein and Georg von Finck, assignors to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany. Filed Jan. 8, 1938. 8 claims. (Cl. 91-68). The impregnating agent is formed from the reaction of a phenol of the general formula RCH_2Cl and a nitrogen base and a mixed polymerisate from maleic anhydride and a vinyl ester or ether.

2,234,565. Moistureproof coating. Daniel D. Lanning, assignor to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed Sept. 8, 1937. 18 claims. (Cl. 91-68). A solution in an organic solvent of a film-forming ingredient, a wax moistureproofing agent and the aluminum salt of rosin and modified rosin.

2,234,646. Water resistant alkali silicate composition. Chad H. Humphries, assignor to Insolna Corporation, New Orleans, La. Filed Aug. 15, 1938. 1 claim. (Cl. 134-11). The formula consists of 0.5 gallon of water glass, 0.5 gallon of water 1 to 6 ounces of formaldehyde, 0.33 to 1.5 ounces of sodium aluminate and 1 to 3 ounces of sodium abietate.

2,234,648. Process of making colored paper. Herbert A. Lubs and Edwin R. Laughlin, assignors to E. I. du Pont de Nemours & Co., Wilmington, Del. Filed Sept. 14, 1937. 7 claims. (Cl. 8-7). Paper is wetted on the surface with a solution comprising an azo dye coupling component and a diazotized aryl amine and dried.

2,234,672. Protective composition. C. Roy Gleason, assignor to Insolna Corporation, New Orleans, La. Filed Aug. 22, 1938. 2 claims. (Cl. 260-739). The formula calls for 0.5 gallon of water glass, 0.5 gallon of water, 0.5 to 3 ounces of formaldehyde and 1 to 2 ounces of 40-60 per cent latex dispersion.

2,234,694. Stencil sheet and process for forming the same. Louis E. Fuller, New York, N. Y. Filed Jan. 23, 1940. 16 claims. (Cl. 41-38.6). An open fibrous material is impregnated with an ester of cellulose and a higher fatty acid anhydride.

March 18, 1941

2,234,979. Apparatus for producing molded pulp articles. Walter H. Randall and Richard L. Emery, assignors to The Canal National Bank of Portland, Portland, Maine. Filed April 29, 1937. 18 claims. (Cl. 92-56).

2,235,176. Process for preparing porous plates from cement and fibrous material on board-making machines. Stefan Schless, Berlin-Wilmersdorf, Germany, assignor of thirty per cent to Fritz Quade. Filed July 16, 1937. 4 claims. (Cl. 92-66).

2,235,212. Asphalt strip shingle. Louis Herscovitz, assignor to The Ruberoid Company, New York, N. Y. Filed April 23, 1940. 9 claims. (Cl. 108-7).

2,235,348. Method and means for forming paper cups. Walter E. Amberg, assignor to Universal Paper Products Company, Chicago, Ill. Filed Jan. 9, 1939. 7 claims. (Cl. 93-36.2). Cone-shaped cups.

2,235,349. Paper cup and method for the manufacture thereof. Ralph G. Amberg, assignor to Universal Paper Products Company, Chicago, Ill. Filed May 6, 1939. 7 claims. (Cl. 93-36.2). Cone-shaped cup.

2,235,462. Manufacture of an improved tall oil. Harold R. Murdock, assignor to The Champion Paper and Fibre Company, Canton, N. C. Filed Aug. 11, 1938. 9 claims. (Cl. 260-97.5). A refined tall oil, having an iridescent green color and an improved odor.

2,235,503. Wrapping machine. Charles H. Petskeyes and Israel C. Gellman, assignors to Gellman Manufacturing Company, Rock Island, Ill. Filed Feb. 27, 1939. 23 claims. (Cl. 93-2).

2,235,531. Method of producing paper filler. Joseph E. Plumstead, assignor to West Virginia Pulp & Paper Company, New York, N. Y. Filed Sept. 4, 1931. 14 claims. (Cl. 23-122). Calcium hypochlorite is added to calcium bisulphite solution to produce a calcium sulphate suspension in an acid calcium bisulphite solution; another claim apparently covers the preparation of calcium sulphite by the reaction of calcium bisulphite with milk of lime suspension.

2,235,676. Offset preventing material. Herbert F. Gardner, assignor to Stein, Hall Manufacturing Company, Chicago, Ill. Filed Sept. 22, 1939. 10 claims. (Cl. 101-416). A water-insoluble amylaceous substance and a nonadhesive hydrogel suspending medium, the weight ratio varying from 35:1 to 1:1.

2,235,759. Method of and apparatus for recovery and utilization of sulphur dioxide in sulphite pulp manufacture. Edward M. Frankel, assignor to West Virginia Pulp and Paper Company, New York, N. Y. Filed Aug. 8, 1935. 7 claims. (Cl. 23-131). A method of separating the digester relief into a liquid and a gaseous component without substantial cooling and absorbing the sulphur dioxide under pressure in a nonalkaline menstruum of a nature as to constitute a component of the cooking liquor and recovering the excess of sulphur dioxide in an acid accumulator.

2,235,765. Greaseproofing with low ethoxy ethyl cellulose. Harold C. Kelly, assignor to The Dow Chemical Company, Midland, Mich. Filed May 19, 1939. 1 claim. (Cl. 91-68). At least one side of a paper is coated with a continuous superficial coating of an ethylcellulose having an ether content of 1.75-2.25 ethoxy groups per anhydroglucose unit; the coating is tough and flexible even at subzero temperatures.

2,235,791. Wrapping label. Philip Wohlers, assignor to Milprint, Inc., Milwaukee, Wis. Filed Jan. 13, 1939. 1 claim. (Cl. 91-67.9). A sheet of glassine paper has a local area coated with a thin layer of color-tinted metal ink.

2,235,798. Grease-proofing paper. William R. Collings, Floyd C. Peterson and Harold C. Kelly, asignors to The Dow Chemical Company, Midland, Mich. Filed May 19, 1939. 2 claims. (Cl. 91-68). At least one side of the paper is coated with a continuous superficial coating of a water-soluble cellulose ether of the type whose 5 per cent solution in water has a viscosity above 70 centipoises; the coating is tough and flexible even at subzero temperatures.

March 25, 1941

2,235,837. Bleaching cellulose. John Ogden Logan, assignor to The Mathieson Alkali Works, Inc., New York, N. Y. Filed Sept. 1, 1937. 3 claims. (Cl. 8-108). Bleaching is completed by introducing free chlorine into an aqueous solution of a chlorite in contact with the material to be bleached; the amount of chlorine should not exceed 50 per cent of the amount corresponding to the available chlorine content of the chlorite used.

2,236,005. Apparatus for coating both sides of a web of paper. Peter Jay Massey, River Forest, Ill. Filed Sept. 15, 1939. 1 claim. (Cl. 91-50). An intaglio surface film-forming roll which contacts the wire side of the paper web, a rubber-covered roll in rolling contact pressure with the film-forming roll, a second intaglio roll adjustably cooperable with the rubber-covered roll, means for supplying the liquid suspension to the intaglio surface of the film-forming rolls, and means for rotating the rolls.

2,236,056. Apparatus and method of making corrugated board. Carl W. Grimm, assignor to Henry Pratt Company, Chicago, Ill. Filed Feb. 4, 1938. 6 claims. (Cl. 154-32). Method of conditioning a moist corrugated paper assembly by means of a stream of heated air.

2,236,074. Waterproofing of textile materials. Ferdinand Frederic Schwartz, assignor to American Ecla Corporation, Dover, Del. Filed Dec. 10, 1936. 4 claims. (Cl. 91-68). Aluminum acetate or lactate is used.

2,236,366. Machine for treating paper. Percival W. Chapman, John H. Bell and Oscar A. Jouret, assignors to The Lester Wasley Co., Inc., Norwich, Conn. Filed Nov. 2, 1938. 1 claim. (Cl. 164-61). A device for perforating paper.

Salt of the Earth

Under the above title, Arthur Pound has written the story of Captain John B. Ford and the Michigan Alkali Company. The book, honoring the memory of Captain Ford on the occasion of the 50th anniversary of the Michigan Alkali Company, which he founded, is published by the Atlantic Monthly Company, Boston, Mass. at $2 a copy.

Captain John B. Ford (1811-1903), was one of the outstanding pioneers of American industry. He became interested in the glass manufacturing business through the attempts of his second son, Emory L., who started a small business making bottles and jars in 1864. A year later, Captain Ford founded J. B. Ford & Co. at New Albany, Ind. In the years that followed, Captain Ford experienced many of the difficulties which most pioneer manufacturers have had to contend with and at the age of 69, having lost everything, he began anew. This resulted in the establishment of the New York Plate Glass Company, at Creighton, Pa., in 1880, which name was changed to the Pittsburgh Plate Glass Company in 1884.

In October 1890, Captain Ford founded the Michigan Alkali Company by paying $1,000 into the treasury of J. B. Ford Co., which name was later changed to the Michigan Alkali Company. The story of Captain Ford's business career, as are those of his sons, Edward and Emory, are interesting accounts of how pioneer manufacturers drove on through discouragement and failure to finally achieve great success.

The progress of the Michigan Alkali Company is an interesting part of the book. The company started by making soda ash from limestone and its rapid expansion is an indication how research has increased the use of salt-soda derivatives. The company's two great plants at Wyandotte, Mich., now produces soda ash, caustic soda, bicarbonate of soda, calcium chloride, dry ice, liquid chlorine and other chemicals.

Some Fundamental Factors in Deinking Waste Papers*

By A. O. Bragg[1]

Abstract

Inks differ in oxidation levels, alkaline solutions acting as reducing agents on them. The new inks require special treatments to destroy high oxidation states. With high temperatures and air NaOH oxidizes cellulose which can be avoided by exhausting air and using Na_2CO_3 with NaOH.

In white water + papers, NaOH + Na_2CO_3 softens the liquor, but the pH drop is too great. Straight NaOH is best with white water.

Water dissolves hardening constituents from papers, the amount increasing with temperature. With fresh water, NaOH + Na_2CO_3 increases the cooking time over NaOH, but deinking is more complete and pulp hydration, which reduces washing rate, is reduced.

CO_2 is generated from hydrolysis of casein and protein in coatings.

It is not the intent of this paper to cover the entire field of deinking, but its scope comprises certain fundamental considerations common to all effective deinking operations.

For the purposes of this paper, the term *deinking* can be defined as an operation whereby printed and/or colored waste papers are: (1) reduced to pulp; and (2) put in such condition that, by washing the pulp on a wire screen with a strong spray of water, it is improved in color.

This definition comprises the two general operations in commercial deinking: (1) pulping the papers, and at the same time, putting the ink into such condition that it can be washed from the pulp fibers; and (2) washing the ink from the fibers.

To arrive at one fundamental through the process of elimination, the following operations will not deink waste papers: (1) boiling in water; (2) boiling and agitating in water; and (3) cooking and agitating with water, under pressure.

Although the papers may be pulped by the above operations, in no case can the pulp be improved in color by washing. If an alkali is added, not only is the pulping improved, but more or less of the ink washes away with the wire screen treatment; thus, alkali is a fundamental requirement in deinking and, with its inclusion in the process, the other unit operations can play their part.

Water, being essential not only as a medium for dissolving the alkali and carrying out the deinking reactions but for defibering the papers to pulp, is another fundamental.

We have three fundamentals to start with: papers, water, and alkali.

Papers

An inherent charactertistic of commercial waste paper packings is their irregularity. A certain grade of sulphite, for example, regularly obtained from one reliable manufacturer, will run remarkably uniform in cleanliness, bleachability, color, freeness, and other characteristics. Other things being equal, papers made from it, will reflect its uniformity.

This is not the case with many waste paper packings. Their inherent irregularity is reflected in the greater variability of deinked pulp compared with chemical pulps. To reduce this variability to a minimum, it must be remembered that the purchase of waste paper stocks, is a business of itself; rigidity of purchase specifications, and inspection of shipments before acceptance are vitally important; and that these matters, affecting the quality of the raw materials for the final deinked pulps, are just as important in securing the highest quality deinked pulp at a minimum cost, as the equipment, personnel, and operation of the reclamation plant itself.

The uniformity of deinked pulp being used day after day in high-grade paper is remarkable and is partly accounted for by the use of large stock chests which, holding several tons of pulp, even out the wide fluctuations.

Every batch usually receives the same deinking treatment, especially if a continuous process is used, and the less variation there is in the paper stock the better. There is a definite limit to the quality of pulp which any deinking process can turn out from any given paper.

Sorting Papers

No modern deinking plant operator would think of just opening up the bales and dumping them into the deinking cooker. It is presumed that the papers have been inspected and accepted. Since it is impracticable to tear open every bale and inspect it, with the most rigid of purchase specifications and inspection routine, frequent shipments will contain undesirable materials. These show up in the most unexpected, sudden, and violent fluctuations.

The bales are sorted by girls who, through long experience, quickly recognize and discard the undesirable materials. Groundwood papers; small pieces of cloth, glassine, and waxed papers; cellophane; carbon papers; typewriter ribbons; bits of wood and dirt, etc., are discarded, and the acceptable stock is allowed to pass on the sorting conveyor, to the duster, shredder, and other cleaning, dusting, and size-reduction units, into the deinking equipment proper.

Phloroglucinol solution is used by the sorters to test suspected paper for groundwood. This is almost impossible to eliminate, showing up as yellow or brown specks in the finished pulp. Purchase specifications usually call for a maximum of 1 to 4% of groundwood.

The key employee of the sorting operation is the forelady. She is selected because of long sorting experience; knows by sight the magazines which are all right and which are not. The entire sorting force preferably works on straight time, since piece work has been found to have a bad effect on the quality

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 17-20, 1941.

[1] Diamond Alkali Company, Pittsburgh, Pa.

of the sorting done. For good deinked pulp, good sorting is of fundamental importance.

On "western magazines", packed in small bundles and containing the smallest proportion of difficultly-deinking papers and foreign materials (from 1 to 2% as a general rule), the sorting rate is about 2000 pounds per woman hour. "Eastern magazines" are shipped in large bales, containing from 2 to 5% of discards, and sort more slowly. The rate is about 1000 pounds per woman hour. On flat—i.e., uncrumpled—office waste such as "colored ledger stock", sorting rates run roughly from 373 to 652 pounds per woman hour, but less if the papers are crumpled.

On the other hand, using special packings of one uniform magazine or paper which are known to contain no objectionable materials, as much as 5000 pounds have been sorted by one woman in an hour.

Blending Stocks

The measures just outlined (rigid purchasing specifications, close inspection, and careful sorting) all help to reduce variations; and to them can be added another, intelligent blending of stocks in cooking.

By past experience, the deinking foreman knows the best way to cook the various stocks he receives. Using this knowledge, he can blend a certain percentage of his best, intermediate, and worst grades in the cooks, so that pulp variation is reduced to a minimum. By such methods, very poor stocks, which by themselves would not make acceptable pulp, can be gradually used up without too great an adverse effect being felt on the over-all pulp quality.

Two Extremes in Paper Stocks

This discussion of waste paper stocks might be closed by citing two widely different types, both of which are currently being used to make good pulps. At one extreme, would be shipments of one kind of overissue magazines, such as *Popular Mechanics*. Naturally, such stock needs little sorting because the rejects are small, sorting is fast, and high quality, uniform pulp is consistently produced with a constant deinking treatment.

At the other extreme lies the great variety of papers received on contract to take the entire waste from a large, general printing company. In this case, the number of magazines received will be relatively small; the stock will consist of anything and everything; and it will require the closest kind of inspection and sorting. Printers proofsheets, heavily inked with every color of the rainbow; catalogs in various stages of completion; folders, bulletins, house organs; catalog covers—printed, varnished, and with cellophane, glassine, and other decorative effects; office forms and correspondence, flat and crumpled; rotogravure sheets; outdoor posters; and many other kinds of printed matter constitute the routine raw material of the deinking plant.

This irregularity not only obtains throughout the shipments as a whole, but often occurs as different parts of the same bale, constituting a particularly concentrated and dangerous condition. Without careful selection and blending of such bales by the foreman, the resistant papers will be undercooked and will show up as fine, dark "pepper" specks in the finished pulp.

Ink

Over a considerable period of time, a large commercial printing house has found that its waste, of the type just discussed, averages 1% ink, or 20 pounds of ink per ton of paper. This is present as films of about 0.00006 to 0.00012 inch thickness.

The time-honored method of making printing inks has been to use linseed oil as the principal vehicle and binding agent for the ink pigments. As in linseed oil paint, the glycerides and fatty acids in the oil slowly oxidize by absorbing oxygen from the air to form a tough, elastic film of linoxin. This drying takes place very slowly, a film 0.00012 inch thick requiring about 50 hours to dry naturally.

The addition of certain metallic salts greatly accelerates this drying. It is not known definitely whether they act as oxidizing catalysts or by conveying oxygen to the oil. Cobalt compounds are the most potent, being four or five times as powerful as lead and manganese compounds.

While linseed oil is saponified by hot alkali solutions, the ink pigments thereby being liberated so that they can be washed out, other common printing inks are made from nonsaponifiable mineral oils.

This indicates the following classification of inks from a deinking standpoint:

(1) Those made from alkali-saponifiable oils.
(2) Those made from nonsaponifiable oils.
(3) Special inks, extremely resistant to deinking, made with synthetic resins and organic solvents.

Inks thus vary tremendously in the ease with which they can be broken down and washed from the pulp. Inks in the second and third classes cause most of the trouble from specks—i.e., small particles of undisintegrated ink.

Some of the types of ink which are liable to occur in deinking operations are listed. Since there are numerous variations and formulas, the classifications given are rather arbitrary.

Carton inks, (Class 2), have a high degree of light fastness, and resistance to alkalies such as paste, water glass, soap powders, soaps, etc.

Duplicator inks (Class 1), are compounds formulated with basic dyes dissolved in a mixture of water, acid, alcohol, and glycerine; used to make several copies of a master script.

Indelible inks (Class 1), are specially formulated, patented inks, which cannot be eliminated mechanically or dissolved out from paper.

Metallic inks (Class 2), consist of gold, silver, and aluminum powders, mixed with varnish.

Poster and sign inks (Class 2), possess a high degree of resistance to light, heat, weathering, and acids. Generally made with mineral oil or other nonsaponifiable base and shows a smear if kerosene is rubbed over the surface.

Printing and lithographing inks (Classes 1, 2, and 3), consist of a wide variety of types. The more common are: (1) newsprint ink, which dries by absorption; (2) book ink, which dries by oxidation; and (3) lithographic ink, which consists chiefly of boiled linseed oil and pigment or dye.

Newsprint inks usually consist of rosin dissolved in a cheap mineral oil such as spindle oil or paraffine oil. This varnish is then used as a grinding medium for the carbon black pigment. The rosin is generally dissolved in the oil by the aid of heat. Petroleum and petroleum pitches are sometimes used to reduce tack.

Book inks usually contain rosin and other varnish gums; but very high grade inks of this type usually consist only of boiled linseed oil and special metallic driers.

Inks specially formulated for rotogravure process printing usually contain oxidized (air-blown) as-

phalts, and are characterized by light fastness, cleanliness of tone, and alkali proofness.

Varnish is a constituent of all inks; and the term "ink" as used herein, comprises varnishes as such, as well as constituents of ink. This point is mentioned, because synthetic resin varnishes are extensively applied to paper after printing, and they are extremely resistant to the conventional deinking process.

Two principle classes of special inks are those applied by the vaporin ink process, and the cold-set ink process.

MacArthur *(1)* states that vaporin ink comprises essentially a solid resin, a high boiling solvent, and colored pigment. Unlike the varnish of normal letterpress and offset ink which is chemically converted by oxidation into a hard, dry film, vaporin varnish merely undergoes a physical reaction in its rehardening process, or the "drying" of its ink film.

The paper, after printing with vaporin ink, is passed over a gas flame which volatilizes the solvent. Thus the ink is actually baked on the sheet, but usually over 90% of it solidifies on the surface of the paper. Because of the high drying temperature used, the degree of oxidation of vaporin ink as it exists on the printed sheet is much higher than in the case of ordinary inks dried at ordinary temperatures. The significance of this condition in deinking will be considered later.

Thermoplastic synthetic resins are used in some ink. The ink and type are heated; and the warm ink, contacting the cold paper, chills and "freezes" to the surface. As with the vaporin process, most of the cold-set ink remains on the surface of the paper. The chemical resistivity of synthetic resins makes this type of ink refractory to normal deinking treatment.

The deinking of alkali-saponifiable inks needs no special comment.

Ink Wiping Wads

These are pieces of paper which printers have used to wipe the ink from presses and type and may contain solid ink weighing one half pound, and from ⅛ to ½ inch thick. They occur in waste paper obtained from general printers. Being present in thick layers, the ink does not readily break down while deinking, causing specks in the finished pulp. Outside of stringent purchase specifications, the remedy is the vigilance of the sorters. Their occurrance is especially harmful where a continuous deinking process is used.

When one passage of from 5 to 10 minutes through the pulper is all the treatment which the pulp receives, the short treatment time is not enough to open up and disperse the ink through the pulp so that the chemicals can act on it.

Nonsaponifiable Base Inks

In this class of inks, the greater the nonsaponifiable oil or pitch content, the more the trouble which can be anticipated.

Mineral oil base inks can be readily identified by rubbing the printed paper with kerosene. If the ink smears, it has a mineral oil base. Many lithographed posters and rotogravure printing use such inks. Rotogravure inks frequently contain asphalt or gilsonite which can be identified by dropping ether on the sheet and letting it evaporate. Asphalt materials will form a brown ring. It is perfectly possible for printing ink to be so completely nonsaponifiable that no amount of straight alkali cooking will disintegrate it.

In one case, a certain paper had been cooked under steam pressure for 8 hours with 50% of soda ash. This is 10 to 12 times as much alkali as is used normally in deinking. In spite of this drastic cook, on putting the stock into a beater for washing, the beater was covered with a black, gummy scum, while oil covered the surface of the pulp. Obviously, after such a strong alkaline treatment, these residues could only be nonsaponifiable in nature. The problem was solved by adding 0.75% of bentonite to the cooked pulp in the beater. This adsorbed the oil and tar, allowing them to be washed away.

Oxidation-Reduction in Deinking

It has been shown that common inks are oxidized by the air, assisted by various metallic driers. It has been stated that vaporin process inks are much more highly oxidized than the linseed oil inks because of the baking to which they have been subjected.

Chemically, reduction is the opposite of oxidation, and it is one of the objects of the balance of this paper to show how consideration of oxidation-reduction are of the highest importance in breaking down resistant inks.

With certain glass electrode pH units equipped with a gold or platinum electrode, the oxidation-reduction potential of water and its solutions can be measured in volts. This is the method used in securing the following data.

The single potential E_h of the gold or platinum electrode has been shown to be a measure of the oxidation-reduction system. It is determined by connecting the test solution to a reference electrode, measuring the cell potential E_c existing between the two electrodes, and then compensating this value for the known reference potential E_r for the temperature of the determination, then $E_h = E_c + E_r$, where E_c is given a negative value if the noble metal electrode connects to the negative potentiometer terminal for balance.

The voltage E_h is called the oxidation potential or reduction potential depending on the electrical connections which have to be made to the potentiometer to secure balance. However, E_h has no particular significance in expressing oxidizing or reducing power of a solution, unless the pH is known. Hence, to express oxidation-reduction potential by a single number, pH and E_h are combined into RH or Redox number according to the following formula:

$$RH = 2\ pH + \frac{E_h}{0.03}\ \text{(at 30 deg. C.)}.$$

Oxidation being the opposite of reduction, algebraic addition is involved. If one substance has an oxidation RH of A, and a second a reduction RH of —A, on mixing them their potentials will neutralize each other, resulting in an RH of zero for the mixture.

If the reduction potential of the second substance is less than the oxidation potential of the first, the result will be that the oxidation potential of the first substance will be reduced by an amount equal to the reduction potential of the second, or 2A — A = A.

RH of Water and Its Solutions

Table I gives data on mill water and its solutions after being exposed to the air to insure equilibrium with it so far as dissolving air is concerned. All were brought to a temperature of 30 deg. C.

The RH values for all but 5 in Table I are the

TABLE I.

	pH	RH
Distilled water	7.0	41.7
Well water (hard)	8.3	44.4
Mill drier condensate	11.1	49.7
0.1% Na_2SO_3 solution in mill drier condensate	8.5	35.5
Saturated Na_2SO_3 solution in mill drier condensate	10.25	20.7
NaOH buffer solution in distilled water	11.0	48.2

TABLE II.

	RH	Change in RH (+ or —) based on distilled water
(A) Distilled water vs. NaOH buffer solution		
NaOH buffer solution	48.2	
Distilled water	41.7	
		+ 6.5
(B) Well water vs. distilled water		
Well water	44.4	
Distilled water	41.7	
		+ 2.7
(C) Mill drier condensate vs. distilled water		
Mill drier condensate	49.7	
Distilled water	41.7	
		+ 8.0
(D) 0.1% Na_2SO_3 solution in mill drier condensate vs. mill drier condensate		
Mill drier condensate	49.7	(Total = — 14.2)
0.1% Na_2SO_3 solution	35.5	
		— 6.2
(E) Saturated Na_2SO_3 solution in mill drier condensate vs. mill drier condensate		
Mill drier condensate	49.7	(Total = — 29.0)
Saturated Na_2SO_3 solution	20.7	
		— 21.0

resultants of the combined effects of dissolved air plus dissolved alkaline solids. However, since all samples were in equilibrium with the air, and at the same temperature, the changes in RH in (A), (B), and (C), Table II, reflect the effects of dissolved alkaline solids only. The RH changes in (D) and (E), Table II reflect only the effect of the removal of dissolved oxygen..

TABLE III

Change in RH (+ or —) Based on distilled water	Cause of Change in RH	Reference (Table II)
+ 6.5	Addition of NaOH sufficient to increase pH from 7.00 to 11.00	(A)
+ 2.7	Addition of calcium and magnesium compounds equivalent to total hardness of 18.0 grains per gallon, as $CaCO_3$	(B)
+ 8.0	Additional calcium and magnesium compounds	(C)
— 6.2	Partial elimination of dissolved oxygen	(D)
— 21.0	Complete elimination of dissolved oxygen	(E)

From these tables it is concluded that (1) air-saturated water possesses an oxidizing potential; (2) this potential increases with increase in pH; and (3) to reduce the potential of such water the dissolved oxygen must be removed. This can be done by the (a) addition of a chemical (reducing agent) which absorbs oxygen like sodium sulphite; (b) addition of a chemical such as sodium carbonate which comprises an inert gas (carbon dioxide) and by dilution of the oxygen, reduces its oxidizing tendency; and (c) by boiling the water or by heating the water while inducing a vacuum over it.

Printed ink is an oxidized material, and in the deinking process the alkaline solution acts as a reducing agent on it. In Table IV, stock at 5.7% airdry consistency and 205 deg. F. was circulated by a pump in and out of the deinking chest. The stock consisted of a good grade of magazines, containing some movie magazines, printed with rotogravure inks. On weight of dry papers 4.5% of NaOH was used as the cooking alkali.

Samples were taken 1 hour after adding the NaOH. These were cooled to 30 deg. C., exposed to the air, and then tested.

TABLE IV.

	RH	pH
(1) Water + papers + NaOH, at once after adding NaOH	46.7	12.6
(2) Same, after 1 hour	24.2	12.1

Since Sample 1 was taken immediately after adding the NaOH, and before any appreciable deinking action had taken place, it can be considered as representing the condition of the (Water + NaOH) only, at the outset of the deinking cycle.

At 205 deg. F. practically no oxygen remains dissolved in the liquor so that any oxidation potential from this source is so small that it can be neglected. The reduction in RH of nearly one half in an hour is thus due solely to the effects of the NaOH. These effects are saponification, solution, and disintegration of the inks, varnishes, coatings, sizings, and other materials in the papers, together with the softening of the liquor through precipitation of calcium, magnesium, cobalt, vanadium, and other metals present in the original water and the papers.

Bearing in mind that RH measurements reflect the electrical states of dissolved materials only, according to the definition of oxidation-reduction potential the NaOH has functioned as a reducing agent on the printed papers according to the RH equation:

$$\underset{\text{(Start)}}{46.7} - 22.5 = \underset{\text{(After 1 hr)}}{24.2}$$

(NaOH + Water) (NaOH + Water + Dissolved Materials)

because for one material to reduce another, the potential of the latter must exceed that of the reducing agent.

Since the NaOH solution of RH 46.7, Sample 1, Table IV, starts at once to act as a reducing agent, the necessary inference is that the RH of the original inks and varnishes on the papers is higher than 46.7. Otherwise, by definition, Sample 1 could not act as a reducing agent on them. Expressed in another way, the RH conditions at the start, on mixing the NaOH with the water and papers were as follows:

$$\underset{\text{(RH 46.7 + x)}}{\text{(Papers)}} \qquad \underset{\text{(RH 46.7)}}{\text{(Water + NaOH)}}$$

The more highly oxidized the material to be disintegrated, the lower the oxidation potential—i.e., the higher the reduction potential—must be to neutralize it, and thus cause its disintegration. The NaOH did not impart a sufficiently low oxidation potential to disintegrate the rotogravure inks.

Recognizing the significance of oxidation-reduction potential behavior in the deinking process, the Diamond Alkali Company has developed new methods involving a nickel reducing catalyst. Through its action in imparting an intense reduction potential to the batch of (water + paper + alkali), it causes rapid disintegration of the most refractory inks and varnishes with savings in cooking time, increase in pulp tonnage in a given time, and elimination of dirt and specks.

Water

About 26,000 gallons of water are required to make a ton of deinked pulp; and in view of the importance of this fundamental material, the following data are thought to be of interest.

Two cooks were made on printers waste, one using straight NaOH and the other straight soda ash. They were made in a horizontal, rotary boiler at 40% airdry consistency, using superheated steam at 35 pounds per square inch pressure (Table V).

The river water used was sand-filtered only and had a total hardness of 15.5 grains per gallon as $CaCO_3$.

TABLE V.

	Cook 1	Cook 2
(1) Weight of papers, tons	8.83	8.83
(2) Soda Ash Used	3.96%	....
(3) NaOH Used	....	2.83%
(4) Na_2O, in pounds per ton of papers	46	43
(5) Gallons of water	3600	3600

Total hardness and total alkalinity (as grains per gallon as $CaCO_3$) and pH, at different time intervals throughout the cooks, are given in Table VI.

TABLE VI

Time from start, hours	pH		Total Hardness		Total Alkalinity	
	Cook 1	Cook 2	Cook 1	Cook 2	Cook 1	Cook 2
0	10.2	11.1	0	4.1	750	578
1.3	9.85	10.8	0	5.0	815	407
1.9	9.52	9.55	0	9.0	922	557
2.8	9.15	9.10	0	1.0	708	429
3.8	8.90	8.62	0	0	557	386
6.8	8.45	8.10	0	0	530	350
8.6 (dumped)	8.40	8.05	0	0	450	214

The softening effect of soda ash was instantaneous, the hardness of the cold water being brought to zero during the charging of the rotary with water, soda ash, and papers. Conversely, the NaOH at first hardened the water. Compared with the action of soda ash, NaOH has a stronger solubilizing effect on materials associated with the waste papers; and, as a general rule, this results in greater hardness in the water. Carbonic acid is generated in the cooking process which acts as a softening agent to precipitate the hardening constituents held in solution by the NaOH.

Characteristics of NaOH vs Na_2CO_3 in Cooking Waste Papers

The general characteristics of NaOH vs. Na_2CO_3 in cooking waste papers at high temperatures and consistencies are given in Table VII.

TABLE VII

	NaOH	Na_2CO_3
(1) Rate of cooking	Fast	Slow
(2) Color of pulp	Tends to yellowish	Whitest
(3) Cellulose degredation	Most	Tends to protect pulp against oxidation.
(4) Softening effects on hard water	Least	Most

In cooking general printers waste with soda ash, a grey soapy slime frequently forms on the flat screens which is an agglomeration of insoluble soaps formed by reaction of the lime and magnesium from the papers, with the carbonate radical of the soda ash and of the carbonic acid formed in the cook.

These agglomerates form nuclei which, through adsorption, collect various coloring materials, carrying them through the system in such form that they do not readily wash out. They show up as "pepper specks" in the finished pulp. This is especially the case when the washing equipment is overloaded, since frequently pulp containing such agglomerates can be hand washed to a good color and cleanliness, while the mill-washed pulp remains dirty. This indicates that the coloring materials constituting the agglomerates, have been properly disintegrated in the cooking but have reunited again. The remedy is to use a mixture of NaOH and Na_2CO_3 in suitable proportions, rather than either alkali alone.

The pulp from the soda ash cook was of good quality—white, free, and quite clean—although the grey slime and "pepper" remained. The NaOH pulp was dark, slow, and not satisfactorily deinked, although the greyish slime was missing. The cellulose itself was attacked, the characteristic yellow "alkali cellulose" being formed, and the pulp gave trouble in washing by slipping on the cylinder molds.

The faster cooking properties of NaOH are shown in the more rapid drop in pH and total alkalinity. These faster cooking properties of NaOH are fundamentally due to its highly penetrative action which, in this case, was so fast that its predominant attack was on the cellulose itself, rather than on the ink, this selective action resulting in underdeinked pulp.

Cellulose Degradation in Deinking

Reference has just been made to the tendency of NaOH to attack cellulose, and to the protective action of Na_2CO_3. This is mentioned by Rys and Bonisch *(2)* and Jayme *(3)*, who state that the addition of sodium carbonate to sodium hydroxide has a beneficial effect in the treatment of pulp. The soda ash protects the pulp from oxidation, in the presence of air at high temperatures. Since less cellulose is degraded to oxycellulose, the final pulp contains more alpha-cellulose than with straight NaOH.

Normally, air remains in the rotary boiler during a cook. Acting at high temperature in conjunction with the concentrated NaOH solution present at the high pulp consistencies used in rotary boilers (30 to 40% airdry), air oxidizes some of the cellulose to oxycellulose. This happened in Cook 2, using 2.83% of NaOH, as well as in a similar cook with 3.96% Na_2CO_3 and 1.4% NaOH, or a ratio of 2.8 to 1. Obviously, elimination of air and Na_2CO_3: NaOH ratio are both important.

The total amount of Na_2O as NaOH is a factor, as well as kind of steam. Magazines can be partially pulped successfully, by cooking for 1 hour with 0.89% NaOH at 75 pounds saturated steam pressure, shutting off the steam, and then rolling for 1 hour before dumping. There is no oxycellulose formation.

Since 0.89% NaOH does not harm the stock with high pressure saturated steam, and 2.83% NaOH does harm it with superheated steam, it is apparent that (a) superheated steam is more harmful to use with straight NaOH, than saturated steam, and (b) a critical percentage of NaOH exists at which serious oxycellulose formation begins. As in the kraft digester, reducing conditions during cooking preserve the strength of the stock. They increase the deinking action by lowering the prevailing oxidation potential of the liquor. Every factor tending to increase reducing conditions helps directly in giving the best possible results. To secure these conditions, the following suggestions are made as to deinking in rotary boilers: (1) use of straight NaOH should be carefully considered. Comparatively small amounts can be safely used, with saturated steam. (2) Straight NaOH should not be used with superheated steam. (3) The safest practice is to cook with a mixture of Na_2CO_3 and NaOH in a ratio of at least 3 : 1 and, especially with superheated steam, up to 5 or 6 to 1. (4) In cooking with superheated steam, the total NaOH used should not exceed 0.75%. (5) In the interests of strength of the pulp, in all rotary deinking operations, and as an essential step in rotary boiler cooking with superheated steam when using a mixture of NaOH and Na_2CO_3, the air should be exhausted from the rotaries after they are charged, by a vacuum pump or water or steam jet exhauster. (6) To avoid the action of pure NaOH on the papers while the cooker is being filled and brought up to temperature,

the NaOH and Na_2CO_3 should never be added dry but should be mixed and added as a solution.

Deinking at Low Temperatures, Pressures and Consistencies

This section will consider some of the fundamentals in deinking at low consistencies (those at which pumps will circulate stock), temperatures up to 212 deg. F., and at atmospheric pressures. In general, the comparative behavior of NaOH and soda ash in rotary boiler cooking, given in Table VIII, hold for the lower temperatures, pressures, and consistencies; but they are modified by them, by the lower alkali concentrations, and by the greater mechanical agitation and impact effects imparted to the stock during the circulating process.

The deinking process consists roughly of two successive phases. At first, the less resistant inks are rapidly broken down by the alkali. Since these constitute a major portion of the total, a major portion of the deinking is completed in a minor portion of the total time required to secure good pulp. For a 2-hour cycle, perhaps 90 to 95% of the inks are disintegrated in the first half to three quarters of an hour.

The rest of the time is required to disintegrate the highly oxidized materials to avoid specks. Although these materials represent a small fraction of the total ink, because of their extreme resistivity, a comparatively long treatment with straight alkali is required to break them down. The less resistant inks have low oxidation potentials, and rapidly disintegrate under the reducing action of the alkali. Since this solution has a relatively high oxidation potential at the start of the deinking (Table IV) the potential difference between it and the less resistant inks is small but enough.

The oxidation state of the resistant inks disintegrated in the final phase is high, and that of the alkali solution, while lower, is still so high by comparison, that there is not enough "spread" between the two potentials to cause rapid disintegration, therefore, considerable time is required in the last phase; and if the inks and varnishes are extremely resistant, straight alkali alone may be insufficient to deink them at all.

With low consistency deinking, a 2-hour cycle does not usually cause enough hydration to become a serious factor. In a 5-hour cycle, the stock receives such long violent, mechanical action in the pump, that it shortens and hydrates to such an extent that paper machine speeds may have to be reduced. While violent mechanical action is essential in the low consistency method to loosen up and free the chemically disintegrated ink from the fibers, the duration of its application should be reduced to a minimum through any means possible.

This can be effectively done through accelerating the disintegration of the resistant inks in the final phase of deinking by application of the nickel catalyst.

Use of White Water in Deinking

Deinking in white water invariably gives pulp of duller color than in fresh water, even though the alkalis soften the cooking liquor. White water, softened by a mixture of NaOH and Na_2CO_3 as deinking alkalies, does not deink as well as if used in a harder state with NaOH alone. This is shown in the data from four cooks which used the same amount of available alkali as Na_2O in white water but in different ways.

The magazines were brought to 4.0% airdry consistency with the white water, first-stage alkali added, and the mixture kept at 140 deg. F. for 30 minutes, when the first-stage sample for pH and hardness was taken. The stock was then heated to 212 deg. F. second-stage alkali added, sample (time = 0) taken at once, and successive samples as shown in Table VIII. The pulp was kept at 212 deg. F. for the tests.

The water used was a mixture of clarified paper machine white water, and bleach washer white water. The characteristics of this water were:

Total hardness = 20.2 grains per gallon, as $CaCO_3$
Temporary hardness = 3.2 grains per gallon, as $CaCO_3$
Permanent hardness = 17.0 grains per gallon, as $CaCO_3$
pH = 7.9

TABLE VIII

Cook 1	Cook 2	Cook 3	Cook 4
(Stage 1 after 30 min. at 140 deg. F.)			
1.0% NaOH 4.0% Consistency	1.0% NaOH 4.0% Consistency	1.0% NaOH 4.0% Consistency	1.31% Na_2CO_3 4.0% Consistency
pH = 10.0	pH = 9.70	pH = 10.55	pH = 8.75
Total hardness = 5.25	Total hardness = 5.6	Total hardness = 4.6	Total hardness = 11.5
(Stage 2 raised to 212 deg. F. and balance of alkali added)			
3.0% NaOH	1.5% NaOH + 1.96% Na_2CO_3	3.93% Na_2CO_3	3.93% Na_2CO_3
Total Na_2O = 3.04%	Total Na_2O = 3.04%	Total Na_2O = 3.04%	Total Na_2O = 3.04%

Time after alkali, min.	Cook 1 pH	Cook 1 Total hardness	Cook 2 pH	Cook 2 Total hardness	Cook 3 pH	Cook 3 Total hardness	Cook 4 pH	Cook 4 Total hardness
0	12.3	2.0	12.7	1.9	11.21	0.30	10.3	0.35
15	12.6	1.75	12.2	0.75	10.55	0.5	10.12	0.45
30			11.4	0.90	10.15	0.45	10.10	0.30
45	12.1	1.55	11.3	0.75	10.2	0.35	9.85	0.25
60	12.0	1.80	11.6		10.3	0.25	9.95	0.25
90					10.35	0.75	10.05	0.50
Hardness, ave.		1.77		1.07		0.43		0.35

	Cook 1	Cook 2	Cook 3	Cook 4
	Stage 1			
NaOH %	1.0	1.0	1.0	0
Na_2CO_3 %	0	0	0	1.31
pH	10.0	9.70	10.55	8.75
Total hardness	5.25	5.60	4.60	11.50
	Stage 2			
Total NaOH %	4.0	2.5	1.0	0
Total Na_2CO_3 %	0	1.96	3.93	5.24
Total Na_2O %	3.04	3.04	3.04	3.04
Hardness, ave.	1.77	1.07	0.43	0.35
pH(45 min.)	12.10	11.30	10.20	9.85
Deinking rating	1	2	3	4

It is apparent from the data in Table VIII that white water acts oppositely to fresh water in that, when the softness is increased by adding soda ash to the caustic, the deinking efficiency drops. This is due to the concurrent drop in pH, which is a measure of active alkalinity which actually carries out deinking.

In the above runs, none of the pulps were sufficiently bright to be acceptable for making the highest grade papers, although good enough for cheap and medium grades.

The data show that hard white water functions best with straight NaOH, contrasted with hard fresh water which works best with a mixture of NaOH and Na_2CO_3.

Hard Fresh Water

Hardness values are total, expressed as grains per gallon as $CaCO_3$. Hardness data represent conditions at the start of the low consistency-temperature-pressure cycle, at 205 deg. F. and 11.0% airdry consistency (*see* Tables IX, X, XI).

The fresh water had an initial hardness of 14.0 but, before being added to the papers, NaOH was

added and it was brought to boil, thus reducing its hardness to zero. The hardness given in Table IX represent the hardening effect of constituents dissolved from the papers.

TABLE IX.—EFFECT OF INCREASED NaOH.

NaOH on magazines, %	Total hardness gr./gal.
2.66	5.0
3.50	2.8
3.90	7.0
4.35	7.5
5.27	8.0

The abrupt hardness increase after the critical point (3.50%) corresponds to the rise obtained in the rotary boiler Cook 2 in Table VI. By adding soda ash to the caustic soda, this hardness pick-up in hard fresh water deinking is avoided (Table X).

TABLE X

NaOH, %	Na_2CO_3, %	Ratio of NaOH:Na_2CO_3	Total hardness, gr./gal.
3.50	0	.....	5.5
3.50	0.036	97:1	5.5
3.50	0.1096	31:1	5.5
3.50	0.720	4.9:1	4.5
3.50	0.772	4.53:1	3.0
3.50	1.11	3.15:1	0.9
3.50	1.25	2.80:1	1.4

The cooking time required and degree of deinking measured in speck and dirt count in mill cooks using different amounts of caustic soda and soda ash in the hard fresh water are given in Table XI. Dirt counts are averages on several samples by three independent observers.

TABLE XI.

Cooks, no.	NaOH, %	Na_2CO_3, %	Na_2O, %	Increase in Na_2O	Cooking time, min.	Speck count, ave.
8	3.50	0	2.66	+ 0.64	153.5	44
7	2.66	0	2.02	.....	182	45
4	3.50	1.25	3.39	+ 0.73	173	41

The hydrating and fiber shortening effects due to violent mechanical agitation in hot alkaline solutions come into play in this instance, even though the time of treatment is comparatively short. There was no difficulty with 2.66% NaOH; but when this was increased to 3.50%, the extra hydrating effect of the additional caustic soda was sufficieint to make the pulp slide on the cylinder molds of the washer. Washing capacity was cut down. While mixing soda ash with caustic soda, lengthens the actual cooking time, better deinking and fewer specks are obtained. The greater dissolving power of the softer NaOH + Na_2CO_3 liquor is reflected in its color at the end of a cook. The mixed alkali liquor provides a means of increasing the alkalinity of the deinking process, without increasing its hardness and decreasing its cooking efficiency, and without causing trouble from cellulose degradation.

Water and NaOH Treatment of Magazines

Tables XII and XIII give data obtained by soaking magazines in water and then adding NaOH. They show the large amount of water-soluble, hardening constituents dissolved.

TABLE XII.—Total hardness in grains per gallon as $CaCO_3$

(1) Fresh water	14.0
(2) Water + Paper, 90 deg. F., 7.0% airdry consistency	22.5
(3) Water + Paper, 212 deg. F., 7.0% airdry consistency	25.0
(4) Water + Paper, 212 deg. F., 7.0% airdry consistency, at once after adding 3.0% of NaOH	7.0
(5) Item 4 after 30 minutes agitation	3.5

Formation of Carbon Dioxide in Deinking

In the initial coating process where the amino

TABLE XIII

Note: (—) indicates increase in softness and decrease in hardness. (+) indicates decrease in softness and increase in hardness.

	Change in hardness (+)	Change in hardness (—)	Change in Hardness, % (Based on Starting Point) (+)	Change in Hardness, % (Based on Starting Point) (—)
(1) Effect of material from 17% of airdry, new magazines dissolving in 83% of cold, fresh water. (7.0% consistency)	22.5 14.0 (start) + 8.5	....	+ 60.7%	....
(2) Effect of additional material dissolved by boiling (1)	25.0 22.5 + 2.5	....	+ 17.8%	....
(3) Total hardness increase from (1) and (2), imparted by diluting to 7.0% consistency and boiling	25.0 14.0 (start) + 11.0	....	+ 78.5%	....
(4) Instantaneous softening effect of addition of 3.0% of NaOH to (2) boiling	....	25.0 7.0 — 18.0	....	— 72.0%
(5) Further softening of (4) by boiling and agitating 30 min.	....	7.0 3.5 — 3.5	....	— 14.0%
(6) Total softness increase from (4) and (5) imparted by 3.0% NaOH, and 30 min. boiling and agitation	....	25.0 (start) 3.5 — 21.5	....	— 86.0%

acids, casein, and protein, used as adhesives in coated paper, are dissolved in alkalies, Na_2CO_3 and borax, ammonium and sodium caseinates, and proteinates are formed by neutralization of the acids. Casein is a strong enough acid to displace carbon dioxide. When the coating contains calcium carbonate, calcium caseinates and proteinates are formed. Casein, protein, and their salts hydrolyze when heated in alkaline solution with the ultimate formation of ammonia and carbon dioxide. These reactions are the source of the carbon dioxide formed in the deinking process.

Using the double indicator titration method—with methyl orange and phenolphthalein—titrations with standard acid of samples taken at the beginning and end of NaOH deinking cooks have shown that (a) large amounts of carbon dioxide are generated; (b) if less than a certain amount of NaOH is used (depending on the type of paper stock), the liquor at the start of the cook consists of hydroxides and carbonates, while carbonates and bicarbonates predominate at the end; and (c) if more than this amount of NaOH is used with the same paper stock hydroxides and carbonates only predominate throughout the cook. Since these cooks were made in water presoftened to zero hardness, all carbonates and bicarbonates present came from the papers and not from the water (Table XIV).

TABLE XIV

NaOH in magazines and books, %	Bicarbonates Start of cook	Bicarbonates End of cook	Carbonates Start of cook	Carbonates End of cook	Hydroxides Start of cook	Hydroxides End of cook
2.66	no	yes	yes	yes	yes	no
4.35	no	no	yes	yes	yes	yes
5.27	no	no	yes	yes	yes	yes

The first hydrolytic product is ammonium carbonate. In the hot alkaline deinking solution, this breaks down into ammonium hydroxide which, being volatile, finally breaks down into hydroxyl and ammonia, leaving the carbon dioxide free to combine as bicarbonate. The Kjeldahl NH_3 in commercial casein runs from 13.0 to 13.5%; and the carbon, determined by ultimate analysis, from 52.96 to 54.0%. When it is considered that the weight of casein is from 18 to 20% or higher, of the coating weight, and that even a 55-pound sheet, coated one side, consists of 40 pounds of paper plus 15 pounds of coating, it can

be appreciated that a 2- or 3-ton batch of magazines can easily contain 100 or more pounds of casein and protein. This will make a lot of carbon dioxide.

The carbonate radical is desirable to prevent cellulose degradation; but the objection to the bicarbonate radical is that it lowers the pH of the cook as shown in Table VI, and the Na_2CO_3 cook did not drop in pH, nearly as fast as the straight NaOH cook. Other things being equal, the higher the pH maintained during the deinking process, the faster and more efficient the saponification, alum neutralization, and ink disintegration results.

The carbon dioxide in NaOH cooking neutralizes the NaOH as follows:

$NaOH + CO_2 + H_2O = NaHCO_3 + H_2O$, thus causing the pH drop.

Through increasing the ratio: CO_3^{--}/HCO_3^{-} the mixing of Na_2CO_3 with NaOH acts as a buffer.

The lower the pH is during deinking, the higher the oxidation potential and the poorer the deinking. It is advisable to make, not only pH determinations, but total alkalinity titrations as above, when the deinking procedure is being standardized, to make sure that enough alkali is added to eliminate or minimize the formation of bicarbonates.

Literature Cited

(1) MacArthur, Charles, "Printing with rapid drying inks," *Tech. Assoc. Papers* 20:358-359 (June, 1937); *Paper Trade J.* 105, no. 15:37-38 (Oct. 7, 1937).
(2) Rys, L., and Boenisch, A., "Refining of pulp," *Paper Trade J.* 106, no. 19:31-40 (May 11, 1939).
(3) Jayme, Georg, "Refining of pulp in the light of patent literature," *Paper Trade J.* 108, no. 21:37-42 (May 26, 1938).

Prime Movers in Pulp and Paper Industry

In a preliminary report on power equipment and electric energy consumption, prime movers, motors, and generators in the manufacturing plants of the United States are statistically enumerated by the Dept. of Commerce based on the 16th decennial census.

Engaged in Manufacturing

Industries engaged in manufacturing reported a prime-mover installation aggregating 21,266,557 horsepower, a gain of 1,111,160 horsepower or 5.5% during the decade ending in 1939; and 29,887,966 horsepower for electric motors driven by purchased energy, a gain of 31.2%. There was a decrease of 6.7% in the number of establishments, from 193,969 ten years ago to 181,000 in 1939. The greatest gain was for steam turbines, 3,564,826 horsepower or 46.1%. Steam engine installation decreased by 3,066,675 horsepower or 31.9%. Internal combustion engines increased by 568,958 horsepower or 46.1%; hydro-turbines and water wheels increased by 44,051 horsepower or 2.9%.

The continued trend toward electrification of industry is indicated by the increase of 10,814,584 horsepower of installed electric motors, a gain of 30.8% in the decade. The rates of increase in the use of the two classes of electric motors (those driven by purchased energy and those driven by energy generated within the plant) are nearly the same — 31.2% and 29.9%, respectively.

Data for Pulp and Paper Mills

The data for pulp, paper, and paperboard mills are given below. The data are combined because of the impossibility of obtaining separate data. From a total of 832 plants, 805 reported power equipment aggregating 2,745,059 horsepower of prime movers.

	Total		Driving Generators		Not Driving Generators	
Prime Mover	no.	hp.	no.	hp.	no.	hp.
Steam engine...	1511	396,515	393	177,409	1118	219,106
Steam turbine..	1411	1,593,097	617	1,478,697	794	114,400
Diesel, etc.....	17	3,209	6	1,730	11	1,479
Other internal combustion engine	22	4,078	9	2,168	13	1,910
Hydroturbine & water wheels.	1146	748,160	670	467,934	476	280,224

Idle horsepower of prime movers in the pulp and paper industry is reported as ordinarily 228,804.

Classifying the generators according to the type of prime mover, the total kilowatt rating was 1,517,966. The data are as follows:

Prime Mover	Kilowatts
Steam engine	123,032
Steam turbines	1,061,038
Diesel and semidiesel engines	1,263
Other internal combustion engines	1,563
Hydroturbines and water wheels	331,050
Generators idle	138,567

Horsepower of Electric Motors

The aggregate horsepower of the electric motors used in the industry was 3,213,637. Of these, 39,592 motors were driven by purchased energy with a capacity of 1,102,675 horsepower; while 88,931 motors were driven by plant energy, with a capacity of 2,110,962.

Electric Energy Generated

The electric energy generated in the plants was 6,297,943,284 kilowatts, of which 210,499,793 kilowatts were sold. The industry purchased 2,972,958,641 kilowatts. This indicates that the pulp, paper, and paperboard mills used 9,060,402,132 kilowatts of electric energy.

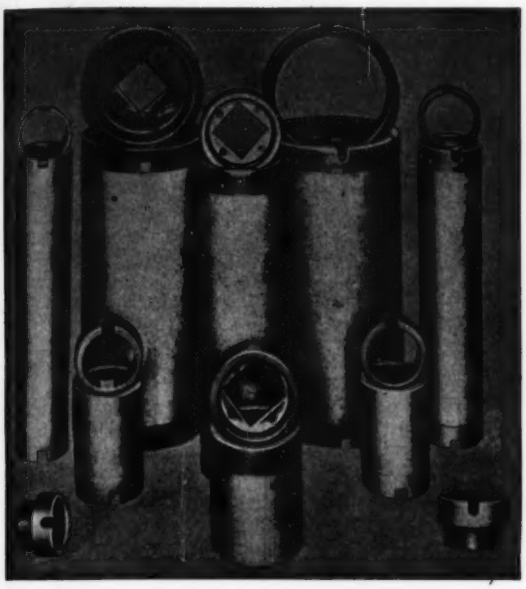
Summer Pulp Courses at Maine

The University of Maine will again conduct a summer course in Pulp and Paper Technology and Chemical Engineering during the six weeks between July 7 and August 15, 1941.

The Pulp and Paper Technology courses include lecture courses in pulp and paper manufacture and laboratory courses in papermaking, pulp coloring, and paper testing. These courses are designed for paper salesmen, laboratory helpers, etc. who previously have not had an opportunity to obtain a general scientific understanding of the pulp and paper industry. In addition to class and laboratory work there will be a number of mill visits.

The chemical engineering courses include laboratory and lectures, the theory of which is based on chemical engineering equipment, some pieces of which are particularly suited to the pulp and paper industry.

A copy of the Summer Session Catalogue, which explains courses offered, expenses, etc. may be obtained by addressing Director R. M. Peterson, University of Maine, Orono, Maine, and if interested, early reservations should be made.



ELIXMAN

CAPS

Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all standard sizes.

Heavy duty caps with reenforced square hole. This patented feature of reenforcement gives added strength and durability.

CORES

Samples of caps or cores will be gladly submitted

ELIXMAN PAPER CORE COMPANY, INC.
CORINTH, N. Y.

Appleton WIRES
ARE GOOD WIRES

Appleton Wire Works, Inc. Appleton, Wis.

Imports of Paper and Paper Making Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard; Bleached Sulphite More Acute—Some Grades of Old Waste Lower.

Effective September 30, 1939, under Treasury Decision 49,970, all publications, exchanges and trade associations, were denied access to import manifests at the New York Customs House. The Paper Trade Journal and other interested parties have vigorously protested this ruling, and as soon as the order of the Treasury Department is modified or rescinded, full publication of all manifests will be resumed in these columns. In the interim, the Paper Trade Journal is making every possible effort to gather all available information from manifests, at various outside sources.

NEW YORK IMPORTS

WEEK ENDING APRIL 19, 1941

SUMMARY

Newsprint .....3,889 rolls
Filter paper .....26 cs.
Drawing paper .....9 cs.
Photo paper.....53 cs.
Tissue paper.....5 cs.
Miscellaneous paper.....9 cs.

NEWSPRINT

——, ——, Cornerbrook, 1,090 rolls.
——, ——, Cornerbrook, 2,799 rolls.

FILTER PAPER

H. Reeve Angel & Co., Inc., ——, Liverpool, 24 cs.
Selber Hegner & Co., Inc., ——, Yokohama, 2 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., ——, Liverpool, 9 cs.

PHOTO PAPER

——, ——, Liverpool, 53 cs.

TISSUE PAPER

——, ——, Liverpool, 5 cs.

MISCELLANEOUS PAPER

Marr Duplicator Co., Inc., ——, Yokohama, 8 cs.
——, ——, Liverpool, 1 cs.

RAGS, BAGGINGS, ETC.

——, ——, Liverpool, 40 bls. rags.
New England Waste Co., ——, Santos, 331 bls. cotton linters.
Philadelphia National Bank, ——, Santos, 549 bls. cotton linters.
West Texas Cottonoil Co., ——, Santos, 1,436 bls. cotton linters.
Tradesmans National Bank Trust Co., ——, Santos, 655 bls. cotton linters.
——, ——, Santos, 2,286 bls. cotton linters.
W. Intner Co., Inc., ——, Bombay, 180 bls. cotton waste.
Green Textile Associates, Inc., ——, Shanghai, 200 bls. cotton fly waste.
Padawer & Co., ——, Shanghai, 225 bls. cotton waste.
Brandwein Mazur Co., ——, Shanghai, 123 bls. cotton waste.

GLUE BONES

——, ——, Santos, 2,240 bags.

BOSTON IMPORTS

WEEK ENDING APRIL 19, 1941

Green Textile Associates, Inc., ——, Bombay, 300 bls. cotton waste.
Chemical Bank Trust Co., ——, Shanghai, 100 lbs. cotton picker waste.

LOS ANGELES IMPORTS

WEEK ENDING APRIL 19, 1941

——, ——, Osaka, 8 cs. tissue paper, 7 cs. filter paper.
——, ——, Yokohama, 3 cs. wallpaper, 1 cs. rice paper.
——, ——, Kobe, 5 cs. rice paper.
——, ——, Shanghai, 17 bls. waste bagging.
——, ——, Chemainus, 2,820 pkgs. newsprint.

Bertchill Metric Calculator

For many years the exporters of papers and paper boards in this country have been obliged to refer to tables in various books printed in foreign countries when transposing grams per square meter into pounds. The tables in these foreign books give only a few weights and sizes used in this country.

An entirely new and simplified system has been devised and copyrighted by Berton C. Hill, export sales manager of the American Coating Mills, Inc., which simplifies the method of transposing grams per square meter into the weights of standard and special sizes used in this country and also explains a very practical and simple method of transposing our regular and special size weights into grams per square meter. Mr. Hill has had over twenty-five years experience in transacting foreign business with paper exporters and manufacturers, and the system he has developed will go a long way toward shortening the work of transposing foreign specifications.

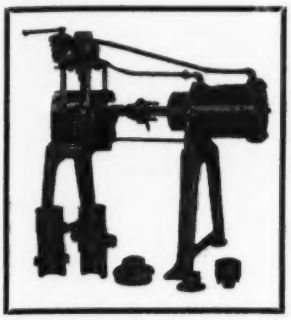
The Bertchill Metric Calculator has been arranged in a manner most convenient to manufacturers and exporters and covers the weights of all the standard sizes of fine papers, book papers, miscellaneous papers, card boards and box boards. The use of this system will enable anyone not experienced in metric calculations to transpose correctly, and by only one multiplication, all weights and measures in use in the paper trade into metric weights and measures.

There is also included into this calculator a very simple method of transposing centimeters and millimeters into inches and also transposing inches into centimeters and millimeters besides explaining the method of transposing kilograms into pounds and pounds into kilograms. This calculator is quite an innovation and should be in the possession of all concerns interested in foreign trade. Many exporters who have adopted the Bertchill Metric Calculator have expressed high praise for its real simplicity. Price — $1.50 with leatherette folder. Extra copies $1.00 without folder.

William G. Shortess Honored

William G. Shortess, founder and president of the Federal Paper Board Company, was honored at a dinner given by employees and associates at the Hotel Commodore, New York, on April 19.

The occasion marked the 25th anniversary of the founding of the company. Mr. Shortess, who is one of the pioneer manufacturers in his field, having been associated with the industry for nearly half a century, was presented with a bronze plaque.



Core Cap Remover

U. S. Patent No. 1692274

A simple and efficient machine for removing metal caps from paper cores. Compressed air is used and operation is controlled by a single valve. Additional die equipment is available to recondition caps after removal.

Bulletin will be sent on request.

Montague Machine Company
Turners Falls, Mass.

Slimform* CHECKS OUT
when you call in W&T

*Slime - forming micro-organisms that thrive in process water.

When slime-forming micro-organisms are "at home" in your stock-line, circulating white water and elsewhere in your plant system, you pay double-rates for their keep: 1) In higher production costs due to obstructed lines, plugged felts and blinded wires, frequent breaks and wash-up interruptions. 2) In lowered quality due to spots, stains and pin holes.

Slimform is quick to check out, however, when Wallace & Tiernan water-treatment methods are put into effect. At more than 200 mills, W&T specialists have helped to eliminate slime and other forms of water-borne contamination by application of ammonia-chlorine or other microbiological treatment appropriate to plant conditions. The cost averages no more than 1½ to 6 cents per ton of product.

P 23

WRITE FOR 42-PAGE BOOKLET
"Micro-biological Control in Pulp and Paper Manufacture" discusses latest practice now employed at prominent mills. Write for a copy.

WALLACE & TIERNAN CO., Inc.
MANUFACTURERS OF CHLORINE AND AMMONIA CONTROL APPARATUS
NEWARK, NEW JERSEY . . . REPRESENTED IN PRINCIPAL CITIES

New York Paper and Pulp Market Review

Demand Continues At High Level With Prices Firm and Unchanged—Pulp Market Strong With Most Grades Now On Export Control List—New White Rags Slow—Old Waste Paper Easy.

Office of the PAPER TRADE JOURNAL,
Wednesday, April 23, 1941.

Demand for paper, paper board and many paper products continues its upward trend. Reports received from many manufacturers' representatives, jobbers, and general paper merchants during the week indicate the high sales volume is a broad buying movement, stimulated by a steadily increasing and widening consumer demand and the relatively low prevailing prices.

The index of general business activity declined to 120.6% for the week ended April 12, from 121.7% for the previous week, compared with 98.2% for the corresponding week last year. Paper board production for the week was up 4.3% from the preceding week.

Paper production for the week ended April 12 was estimated at 94.9%, compared with 81.8% for 1940, with 80.3% for 1939, with 68.0% for 1938, and with 93.3% for the corresponding week for 1937.

Paper board production for the week ended April 12 was 85.0%, compared with 66.0% for 1940, with 67.0% for 1939, with 58.0% for 1938, and with 88.0% for the corresponding week for 1937.

All trade reports reflect the increasing volume of production in the paper and in many other non-durable industries. The New York paper market is in a strong position, with prices firm and no important changes from representative quoted market prices reported at this date.

Newsprint production of domestic mills for the first 1941 quarter was 5,496 tons more than for the same period last year; Canadian production, 48,540 tons more, while Newfoundland produced 8,796 tons more.

Chemical Pulp

The chemical pulp market continues to maintain a very strong position, with many quarters of the trade reporting receiving more inquiries this week. The higher grades are in most urgent demand, but the demand is also very active in all grades of chemical pulp. Higher quotations are reflected in the minimum prices on the news grade, currently quoted at from $61 to $64.25 per ton. Light and strong kraft pulp is also higher and currently quoted at from 3.75 to 4.15; No. 1 kraft at from 3.60 to 4.00. Other grades of chemical wood pulp are unchanged.

Rags

Mill demand for new white shirt cuttings and new unbleached rags is rather slow at this date. Lower quotations are reported on both of these grades, which are currently quoted at from 6.00 to 6.25. Demand for colored rags is a little more active this week.

Old Rope and Bagging

A good, steady demand for old Minila rope is reported this week. No important change in prices has been reported.

Demand is active in old bagging, with supplies reported inadequately to meet dealer demand. Prices are firm and unchanged.

Old Waste Paper

The paper stock market is easy at this date with prices on the lower grades rather soft. No important change from prevailing quotations has been reported.

Twine

Government buying has given this market additional strength, especially in cotton and jute twines. Prices are firm and unchanged on all grades at this date.

Pulp Under Export Control

President Roosevelt issued on April 16 a proclamation putting many grades of chemical wood pulp on the National Defense Export Control list, as follows:

Sulphate wood pulp, (kraft pulp) unbleached (4608). No license.

Sulphate wood pulp (kraft pulp), bleached (4610). No license.

Sulphite wood pulp, bleached, containing 80% or more alphacellulose (4601-4602). License.

Sulphite wood pulp, unbleached (4606). No license.

Wood pulp screenings and others (4619). No license.

Rags, silk (3798). No license.

On April 23 the President, under recommendation of Brig. Gen. Russell L. Maxwell, Administrator of Export Control, placed casein on the list, effective on May 6.

Powell River Adds Purple Band

The Powell River Company, Powell River, B. C., has now added a new and distinctive touch to its rolls of newsprint in the introduction of its new "purple band". This is a new, colorful and distinct hallmark of Powell River newsprint. The study of newsprint packing has been tackled seriously and scientifically by technical and operating staffs of the company. Over the years, steady improvement has been made following experiments of technicians, advice of operating crews and recommendations of customers. Such studies have naturally had as their objective the protection of newsprint against shipping, climatic, and handling hazards. Concentration has been on utility, not on appearance. Under present and known conditions of handling, transportation and customer's requirements, adequate protection for rolls has been guaranteed and tested. The new laminated body wrap, for example, is becoming increasingly popular. It makes a more effective, compact packing job and has been found to stand up better than most other packs.

And so, with protection at a satisfactory stage for the present the new purple band, imparting a distinct identity to the roll, replaces the equally effective but perhaps more drab end dressings formerly on the rolls. The purple band is of the same tough fiber as its predecessor. It provides the same protection, and is identification of a roll of Powell River newsprint.

Nearly a

CENTURY

OF EXPERIENCE

OLD ENOUGH TO ENLIST IN 1861

When the first shot of the Civil War was fired on Fort Sumter, what is now Textiles' Roll Department had been in business for approximately 20 years — old enough to enlist.

In continuous operation ever since, this department can now draw on practically a century of experience. Not only has this experience been passed on verbally from one generation to another, but it is also available as a permanent record in our files.

While our experience is probably the oldest in the field, it is utilized by men in our organization with young, progressive ideas. The combination is hard to beat.

USE "TEXTILE" ROLLS. YOUR CALENDERS DESERVE THE BEST.

The Textile-Finishing Machinery Co.

New York Office 50 Church St.

Southern Office Johnston Bldg., Charlotte, N. C.

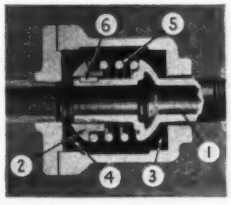
Providence, R. I.

River Raisin Paper Co. OK's the JOHNSON JOINT —295 TIMES

This well-known mill reflects paper industry's swing to the JOHNSON ROTARY PRESSURE JOINT

YOU'VE got to like something pretty well to endorse it 295 times. That is the way the River Raisin Paper Co., and almost the whole paper-making industry, feel about the Johnson Rotary Pressure Joint. More than one hundred mills, for instance, have purchased 50 or more Johnson Joints—thirty seven mills have passed the 100 mark. The Champion Paper & Fibre Co., Hamilton, Ohio, has purchased over 700.

This amazing acceptance, which has been won in just a few years, rests squarely upon the fact that the Johnson Joint is, simply, a better steam fit. It offers benefits that cannot be obtained in any other way, because there's nothing else like the Johnson Joint. Write for new catalog.



HOW IT WORKS

Nipple (1) is fastened to roll. Sliding collar (2) is keyed (6) to nipple. Carbon-graphite rings (3) and (4) eliminate oiling and packing. Spring (5) is for initial seating only—joint is actually pressure-sealed.

The Johnson Joint betters plant operation in two ways: (1) Eliminates steam fit maintenance almost entirely—the Johnson Joint is completely packless, self-oiling, self-adjusting and even self-aligning; (2) Offers a simple, workmanlike way to provide syphon drainage.

USE THE JOHNSON ELECTRAP

• Today's highest development in a trap for pumping or lifting service, draining systems under high vacuum, and boiler feeding. Electric operation removes stuffing boxes, floats and all other moving parts from trap chamber. Control valve gear is one compact assembly—can be mounted in any convenient location if trap chamber must be set in inaccessible position.

The Johnson Corporation

828 WOOD STREET, THREE RIVERS, MICHIGAN

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, April 23, 1941.

BLANC FIXE—Prices on blanc fixe are firm and unchanged and conform to prevailing market levels. The pulp is currently quoted at $35 per ton, in barrels, at works; the powder is currently quoted at $50 per ton, f.o.b., works. Demand reported moderate for the week.

BLEACHING POWDER—Quotations on bleaching powder are firm. Shipments reported steady for the week. Bleaching powder is currently quoted at $2 per 100 pounds, in drums, at works.

CASEIN—Prices on casein are firm, with prices unchanged for the current week. Standard domestic casein, 20-30 mesh, is currently quoted at 14 cents per pound; 80-100 mesh, at 14½ cents per pound. All prices in bags, car lots. Argentina casein, 20-30 mesh, is currently offered at 12½ cents per pound. No quotations on French casein.

CAUSTIC SODA—Quotations on caustic soda are firm and continue unchanged at prevailing market prices. Demand reported good. Solid caustic soda is currently quoted at $2.30 per 100 pounds; flake and ground at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Prices on china clay are firm and conform to prevailing market levels. Demand reported moderate at this date. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay at from $12 to $22 per ton, at mines. Imported clay is currently offered at from $13 to $25 per ton, ship side.

CHLORINE—Quotations on chlorine are firm and unchanged. Market firm. Shipments reported heavy for the current week. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported firm for the week with prices higher on some grades. "G" gum rosin is currently quoted at $1.93 per 100 pounds, in barrels, Savannah "FF" wood rosin is currently quoted at $1.93 per 100 pounds, in barrels, New York. Seventy per cent gum rosin size is quoted at $2.60 per 100 pounds, f.o.b., works.

SALT CAKE—Prices on salt cake are firm and nominal. Demand good. Domestic salt cake is currently quoted at $17 per ton, in bulk; chrome cake at $16 per ton. All prices in car lots, f.o.b., shipping point. The quotation of $16.50 per ton on imported salt cake is nominal.

SODA ASH—Quotations on soda ash are firm and continue to conform to prevailing market levels. Demand reported good for the week. Prices on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Prices on corn starch are moderately firm and continue unchanged for the current week. Pearl is currently quoted at $3 per 100 pounds; powdered starch at $3.10 per 100 pounds. All prices in bags, car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—Quotations on sulphate of alumina are firm. Demand reported good for the current week. The commercial grades are currently quoted at $1.15; iron free at $1.60 per 100 pounds. All prices in bags, car lots, f.o.b., works.

SULPHUR—Prices on sulphur are firm and conform to prevailing market levels. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are quoted at $19 per ton.

TALC—Quotations on talc are firm and continue unchanged at prevailing market prices. Domestic talc is currently quoted at from $15 to $21 per ton, at mines. No quotations on imported talc.

MARKET QUOTATIONS

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	"	—
Kraft—per cwt.—Delivered Zone A			
Northern, Extra Quality	$5.25	@	$6.00
Superstandard	4.87½	"	5.25
Northern Standard Wrapping	4.50	"	5.00
Standard Wrapping	4.50	"	—
Tissues—Per Ream—Carlots			
White No. 1	.97½	"	—
White No. 1 M. G.	.95	"	—
White No. 1½	.80	"	—
White No. 2	.75	"	—
Anti-Tarnish M. G.	.80	"	—
Colored	.85	"	—
Kraft	.87½	"	—
Manila	.77½	"	—
Unbl. Toilet, 1 M.	3.75	"	—
Bleached Toilet	5.26	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.10	"	—
Bleached, Jr.	3.60	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	8.75	@	10.75
No. 1 Manila Wrapping, 35 lb.	5.50	"	5.75
No. 2 Manila Wrapping, 35 lb.	5.25	"	5.50

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1	$39.10 @	$46.00	$40.25 @	$47.25
100% Rag	31.05 "	36.50	32.20 "	37.75
85% Rag	.... "	....	29.90 "	35.00
75% Rag	23.60 "	27.75	24.75 "	29.00
65% Rag	.... "	....	21.65 "	26.25
50% Rag	17.55 "	21.50	18.70 "	22.75
25% Rag	14.65 "	17.75	15.80 "	19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$9.35 @	$11.50	$11.55 @	$12.75
No. 2	8.50 "	10.25	9.65 "	11.75
No. 3	8.05 "	9.25	9.20 "	11.25
No. 4	7.70 "	9.50	8.90 "	10.75

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper.

Delivered in Zone 1:

No. 1 Glossy Coated	$11.90 @	$13.50	
No. 2 Glossy Coated	10.35 "	11.75	
No. 3 Glossy Coated	9.55 "	11.00	
No. 4 Glossy Coated	9.15 "	10.50	
No. 1 Antique (watermarked)	9.05 "	10.50	
No. 2 Offset	8.40 "	9.75	
A Grade E. F.	8.20 "	9.50	
A Grade S. & S. C.	8.45 "	9.75	
B Grade E. F.	7.65 "	8.75	
B Grade S. & S. C.	7.90 "	9.00	
C Grade E. F.	7.35 "	8.50	
C Grade S. & S. C.	7.60 "	8.75	
D Grade E. F.	7.10 "	8.25	
D Grade S. & S. C.	7.35 "	8.50	

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	No prices		
Dry	No prices		
(Delivered)			
No. 1 Domestic and Canadian	40.00	@	42.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	3.72½	@	3.87½
Prime Qualities—			
Easy-Bleaching Sulphite	3.17½	"	3.75
Strong Unbleached Sulphite	3.17½	"	3.75
News Grade, delivered Unbleached Sulphite	61.00	"	64.25
(On Dock, Atlantic Ports)			
Kraft Bleached	4.12½	"	—
Kraft Light & Strong	3.75	"	4.15
Kraft No. 1	3.60	"	4.00
(F. o. b. Pulp Mill)			
Kraft Domestic and Canadian	2.75	"	3.37½
(Delivered)			
Soda Bleached	3.30	"	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.00	@	6.25
Silesias No. 1	4.50	"	4.65
New Unbleached	6.00	"	6.25
Blue Overall	4.15	"	4.50
Fancy	3.25	"	3.50
Washables	2.00	"	2.13
Mixed Khaki Cuttings	2.75	"	3.00
O. D. Khaki Cuttings	3.00	"	3.13

Old Rags

White, No. 1—			
Repacked	3.50	"	3.65
Miscellaneous	2.75	"	3.00
White, No. 2—			
Repacked	2.50	"	2.75
Miscellaneous	2.00	"	2.25
Thirds and Blues—			
Repacked	1.50	"	1.65
Miscellaneous	1.10	"	1.25
Roofing Rags—			
No. 1	1.35	"	1.40
No. 2	1.05	"	1.10
No. 3 (bagging)	.90	"	1.00
No. 4	.60	"	.65
No. 5A	.60	"	.65

Foreign Rags

All prices nominal.

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.71
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.38

Old Rags

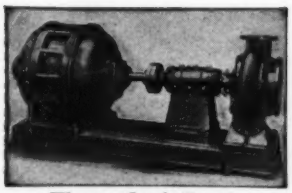
No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—

For Uninterrupted Service

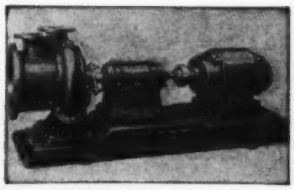
SPECIFY WARREN PUMPS

WARREN Paper Mill Pumps are designed and built to give 24-hour service, 7 days a week, year after year—and to do it at consistently low operating and maintenance costs.

Each Warren Pump is engineered for a specific job, based on a thorough study of definite operating conditions. The four types of Warren Pumps at the right are establishing performance and economy records in pulp and paper mills in every section of the country. It will pay you to specify WARREN for *your* pump requirements.



Warren Stock Pumps



Machine Chest Pumps

Centrifugal Fresh Water Pumps

Liquor Pumps

WARREN STEAM PUMP COMPANY, INCORPORATED, WARREN, MASSACHUSETTS

INDUSTRIAL DEPARTMENT ★ SEABOARD AIR LINE RAILWAY

SHORT CUT *to* FACTS

Everyone knows the South possesses outstanding advantages for manufacturing. However, not all communities in the South offer equal advantages to industry. In the six Southeastern States served by the Seaboard, as elsewhere, a plant location is good or bad depending upon whether it meets the requirements of the enterprise.

SITES
LABOR
TRANSPORTATION
RAW MATERIALS
POWER
LIVING CONDITIONS
CLIMATE
TAXES

WE KNOW THE GOOD PLANT LOCATIONS

For many years we have made a careful study of this territory, and accumulated a great amount of information on plant sites, natural resources and manufacturing conditions. To responsible clients we offer an experienced and competent plant location service without cost or obligation.

Ask us for detailed studies of suitable locations for your business in the Seaboard "Profit Zone". Address Warren T. White, General Industrial Agent, Seaboard Air Line Railway, Norfolk, Virginia.

FREE!

INDUSTRIAL DEPARTMENT **SEABOARD** AIR LINE RAILWAY

No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	"	4.75
No. 2 White Cotton.	3.25	"	3.75
No. 3 White Cotton.	2.50	"	3.00
No. 4 White Cotton.	1.90	"	2.20
Extra Light Prints..	2.00	"	2.40
Ord. Light Prints...	1.75	"	2.15
Med. Light Prints...	1.55	"	1.95
Dutch Blue Cottons.	2.25	"	2.50
French Blue Linens.	3.00	"	—
Checks and Blues...	2.00	"	—
Linsey Garments....	1.90	"	2.00
Dark Cottons.....	1.50	"	1.60
Old Shopperies.....	1.30	"	1.45
New Shopperies.....	1.45	"	1.50
French Blues.....	2.25	"	2.50

Old Rope and Bagging

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	@	3.25
Wool Tares, light...	2.50	"	2.75
Wool Tares, heavy..	2.50	"	2.75
Bright Bagging.....	2.50	"	2.75
Manila Rope—			
Foreign	5.50	"	5.75
Domestic	5.50	"	5.75
Jute Threads.....	2.75	"	3.00
Sisal Strings	2.10	"	2.35
Mixed Strings.....	1.10	"	1.20

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	3.10	@	3.25
Ordinary Hard White No. 1....	2.25	"	2.50
Soft White No. 1..	1.80	"	1.90
Soft White Extra..	2.50	"	2.60
Flat Stock—			
Stitchless	1.10	"	1.25
Overissue Mag.....	.90	"	1.00
Solid Flat Book....	.90	"	1.00
Crumbled No. 1 ...	.70	"	.75
Ledger White Stock.	1.60	"	1.70
Ledger Stock Colored	1.20	"	1.30
Manila—			
New Env. Cut....	1.70	"	1.80
New Cuttings.....	1.30	"	1.40
Old Kraft Machine Compressed bales..	1.30	"	1.40
News—			
No. 1 White News	1.75	"	1.90
Strictly Overissue .	.96	"	1.00
Strictly Folded....	.57½	"	.62½
Corrugated	.57½	"	.62½
No. 1 Mixed Paper..	.42½	"	.47½

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.19½	@	—
White Hemp	.19½	"	—
Fine Polished—			
Fine India.....	.22½	"	—
Unpolished—			
Box	.15¾	"	—
Paper Makers.....	.15½	"	—
Tube Rope.....	.16¾	"	—
Wall Paper.....	.19½	"	—
Wrapping	.19½	"	—
Soft Fiber Rope...	.17½	"	—
Cotton	.24	"	—

(Hard Fiber)

Medium Java.....	.12	"	—
Mex. Sisal.....	.11	"	—
Manila	.25	"	—
Jute Carpet Threads.	2.25	"	2.75
Bleachery Burlap....	4.25	"	4.75
Scrap Burlap—			
Foreign	3.00	"	—
Domestic	2.85	"	3.10
Scrap Sisal.....	2.50	"	2.60
Scrap Sisal for Shredding	2.50	"	2.60
Wool Tares—			
Foreign	(nominal)		
Domestic	2.85	"	3.00
Aust. Wool Pouches.	2.75	"	3.00
New Burlap Cuttings	3.75	"	4.00
Heavy baling bagging	3.00	"	3.25
Paper Mill Bagging..	2.50	"	2.75
No. 2 Bagging.....	.75	"	.80

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	—	@	.03
Fancy Percales....	.03¾	"	4.00
New White No. 1.	.06	"	.06¼
New Light Flannelettes	.03¾	"	4.00
Canton Flannel, Bleached	.06	"	—
Underwear Cutters, Bleached	.05	"	.05¼
Silesias No. 1.....	.04	"	.04¼
New Black Silesias..	3.00	"	3.25
Red Cotton Cuttings	.04	"	.05
Soft Unbleached....	.06	"	.06¼
Blue Cheviots.....	.04¼	"	.04½
Fancy	.01½	"	.01¾
Washable	.01½	"	.01¾
Cottons—According to Grades—			
Blue Overalls.....	.04	"	.04¼
New Black, Soft..	.03	@	.03¼
Khaki Cuttings.....	.02	"	.02¼
O. D. Khaki.....	.02½	"	.03¼
Corduroy	.02	"	—
New Canvas.....	.05½	"	—
B. V. D. Cuttings...	.06	"	.06¼

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	2.75	@	3.00
Miscellaneous	2.00	"	2.25
White No. 2—			
Repacked	1.90	"	2.00
Miscellaneous	2.00	"	2.25
Twos and Blues.....	2.00	"	2.25
Old Blue Overalls...	1.60	"	2.00
Thirds and Blues....	1.25	"	—
Miscellaneous	1.25	"	1.35
Black Stockings.....	3.50	"	4.00
Roofing Stock—			
No. 1.....	1.20	"	1.25
No. 2.....	.95	"	1.00
No. 3.....	.85	"	.95

Foreign Rags

(F. o. b. Boston)

Canvas .....(nominal)	
Dark Cottons.....(nominal)	
Dutch Blues.....(nominal)	
New Checks and Blues(nominal)	
Old Fustians.....(nominal)	
Old Linsey Garments.(nominal)	
New Silesias.....(nominal)	

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1.	.06¾	@	.07
New White No. 2.	.03½	"	.04
Light Silesias.....	—	"	.04½
Silesias, No. 1....	—	"	.04
Black Silesias, soft	—	"	.03
New Unbleached..	.06	"	.06¾
Washable Prints..	.02½	"	.03
Washable No. 1..	—	"	.01½
Blue Overall.....	.04	"	.04½
Cottons—According to grades—			
Washable shredding	—	"	.01½
Fancy Percales....	.03	"	.03¼
New Black Soft...	.02½	"	.02¾
New Light Seconds	—	"	.04
New Dark Seconds	—	"	1.50
Khaki Cuttings—			
No. 1 O. D.....	.03	"	.03¼
No. 2 Mixed.....	.01¾	"	.02
Corduroy	.01¾	"	.01½
New Canvas.....	.04½	"	.05
New Black Mixed.	—	"	.02¾

Domestic Rags (Old)

White No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	3.75	"	3.90
Thirds and Blues—			
Miscellaneous	1.35	"	1.50
Repacked	1.55	"	1.65
Black Stockings (Export)	3.50	"	4.00
Roofing Stock—			
Foreign No. 1....	Nominal		
Domestic No. 1...	1.30	"	1.35
Domestic No. 2...	1.10	"	1.15
Roofing Bagging..	1.00	"	1.05

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Domestic	2.75	@	3.00
Domestic	2.50	@	2.75
Manila Rope.....	—	"	5.50
Sisal Rope.....	2.00	"	2.25
Mixed Rope.....	.75	"	1.00
Scrap—			
No. 1.....	2.60	"	2.80
No. 2.....	—	"	1.50
Wool Tares, heavy..	3.75	"	4.00
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.00	"	3.25

Old Papers

(F. o. b. Phila.)

Shavings—			
Hard White Special	2.50	@	2.70
Hard White.....	2.35	"	2.40
No. 1 Soft White..	1.90	"	2.00
No. 2 White.....	1.70	"	1.85
No. 1 Mixed.....	.90	"	1.00
Solid Ledger Stock..	1.90	"	2.00
Ledger Stock, white.	1.50	"	1.60
Ledger Stock, colored	1.20	"	1.25
No. 1 Books, heavy..	.85	"	.90
Manila Cuttings.....	1.75	"	1.80
Print Manila.....	.60	"	.65
Container Manila....	.50	"	.55
Kraft Paper	1.40	"	1.45
No. 1 Mixed Paper..	.45	"	.50
Straw Board Chip...	.45	"	.50
Binders Board Chip..	.35	"	.40
Corrugated Board...	.60	"	.65
Overissue News.....	.70	"	.75
Old Newspapers.....	.60	"	.65

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.90	@	3.00
No. 1 Soft White	2.50	"	2.75
No. 2 Mixed.....	.90	"	1.00
Solid Ledger Books..	2.00	"	2.10
Overissue Ledger Stock	1.75	"	2.00
White Ledger Stocks	1.50	"	1.65
Mixed Ledgers	1.25	"	—
No. 1 Heavy Books	1.10	"	1.20
No. 1 Books, Light..	.75	"	.85
Crumpled Stitchless Book Stock.....	1.15	"	1.20
Manila Env. Cuttings	2.55	"	2.65
Manila Envelope Cuttings, extra quality	2.65	"	2.75
White Blank News..	1.70	"	1.80
No. 1 Kraft.....	1.35	"	1.45
Extra No. 1 Kraft..	1.75	"	—
Mixed Papers	.45	"	.47½
Print Manila	.60	"	.65
Container Manila....	.60	"	.70
Old Newspapers.....	.50	"	.55
Paper Wool Strings.	.95	"	1.15
Overissue News.....	.65	"	.70
Box Board Chips....	.35	"	—
Corrugated boxes....	.55	"	.65
Kraft corrugated boxes	1.15	"	1.25
New Kraft Corrugated Cuttings	1.75	"	—
Screening Wrappers.	.85	"	.90

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	3.00	@	—
Domestic	3.15	"	—
Sisal Rope.....	2.60	"	—
Mixed Rope	.85	"	1.00
Transmission Rope—			
Foreign	2.50	"	2.75
Domestic	2.75	"	3.00
Soft Jute Rope.....	3.75	"	4.00
Manila Rope—			
Foreign .....(nominal)			
Domestic	5.75	"	6.00

CHICAGO

Waste Paper

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings....	3.15	@	—
No. 1 Hard White	2.50	"	2.65
No. 1 Soft White.	2.00	"	2.20
Ledger and Writings	.85	"	.95
Solid Books.....	.83	"	—
Blanks	1.45	"	—
Kraft	1.40	@	1.50
New Kraft Cuts....	1.60	"	1.75
Overissue News.....	.00	"	—
Old Newspapers—			
No. 1 Folded News	.70	"	.80
No. 1 Mixed Paper	.45	"	—
Roofing Stocks—			
No. 1.....	.95	"	1.00
No. 2.....	.85	"	.90

Watermarks and Folding Endurance

The revised standard method of the Technical Association of the Pulp and Paper Industry for testing the folding endurance of paper, issued in 1940, contains a provision that the area where the flexing takes place shall not contain any portion of a watermark. While at the time it was considered quite certain that test values would be affected by watermarks, there was no known information on the magnitude of the effect. The National Bureau of Standards has obtained such information.

Folding endurance tests were made with a Schopper instrument on normal areas and on watermarked areas of various grades of ledger and bond papers. While, as is to be expected, the comparative values for the two areas were extremely variable, in some cases the differences were very large. In 6 of 13 tests, the folding endurance on the watermarks ranged from 19 to 30 per cent less than on the normal areas. In 4 of the tests, the test values for the watermarked areas were from 3 to 12 per cent less than those for the normal areas. In 1 test the value for the watermarked area was 15 per cent more than that for the normal position. The other 2 tests showed practically no difference.

The Bureau points out that these differences in folding endurance should not be regarded as having any influence on the overall strength of paper as concerns its utility, because of the insignificant area of the watermarked area as compared with the total area.